August 1961

BUSINESS AUTOMATION

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Computers Predict Sales *page 20*

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FORMSCARDS achieve absolutely perfect registration and control because pre-punching and printing are done simultaneously.

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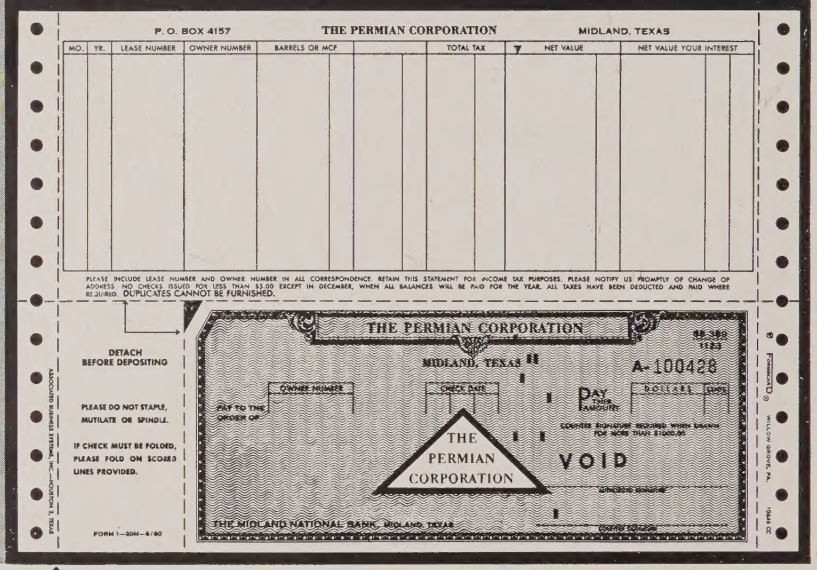

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Samples on request —
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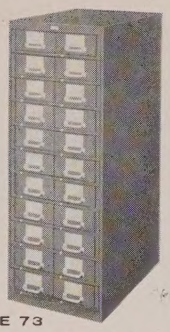
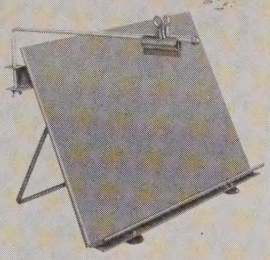
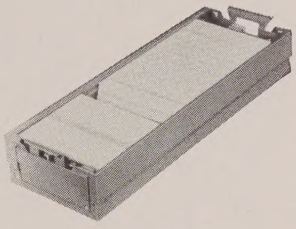

5422 E 73
Horizontal Tab Card File

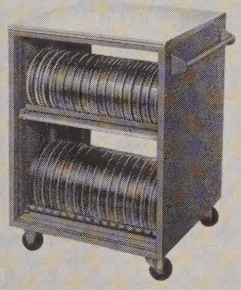
5420 E 37
Vertical Tab Card File

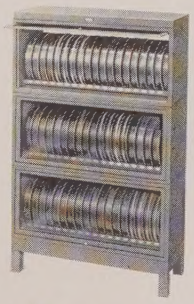

350 WR Wiring Rack


NX73 CT
Tabulating Card Tray

320 KP Key Punch File

356-2CC
Tabulating Card Drawers


331 TT Tape Truck


WS1312 TU Tape Unit

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GF
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BUSINESS AUTOMATION

August, 1961
Vol. 6, No. 2

Reporting and interpreting for management on ideas, developments, applications, results and impact of business automation in commerce, industry and government.

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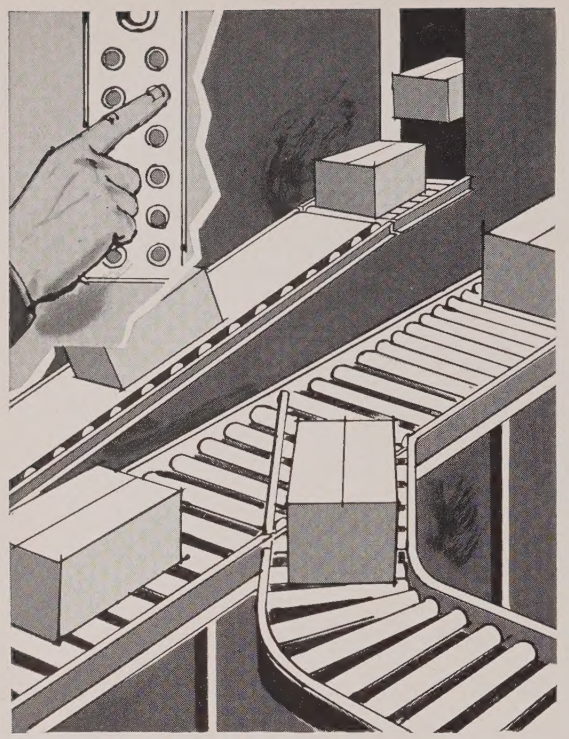

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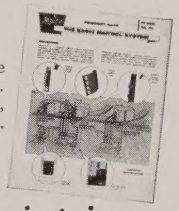

TECHNICAL INFORMATION on the **MAITROL** system is free for the asking. It shows typical uses in product assembly, order filling and paperwork distribution. Write today.

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For More Information Circle Reader Service Card No. 153

Scanning the Issue

AN ACCURATE forecast of sales has long been one of the most difficult problems on the management agenda, particularly where the ultimate sale is at the consumer level. This month's cover feature, **"Computers Predict Sales,"** by Arthur A. Katz, offers solid evidence that a scientific management approach to the sales forecasting problem can produce a practical result with nearly 100 percent accuracy. The story is based on Radio Corporation of America's forecasting technique, used to predict their nationwide sales of television sets. While specific facts and figures are omitted for obvious reasons, the story presents a thorough account of the theory and methods behind the RCA forecasting technique.

Page 20

All too often the EDP spotlight of success is projected on the machines involved, rather than the people. This month, BUSINESS AUTOMATION introduces a series by Arnold E. Keller on the personalities behind many of the country's most advanced data processing installations. First of the series salutes an outstanding personality in the systems profession, **"Tom New of Westinghouse."** Before his recent promotion to the post of manager of accounting, he was manager of business systems of the East Pittsburgh Divisions of Westinghouse Electric. New directed installation of a Univac I in 1955, the initial step in a program of data processing for the East Pittsburgh Divisions, which now boasts one of the world's most powerful systems. He also developed a pioneer, model system to automate engineering drawings at Westinghouse.

Page 26

Taxes may not be any less expensive in Du Page County, Ill., but the taxpayers are just about the best informed in the country. A property tax system, described in **"County Computer Itemizes Taxes,"** was created by Donald R. Smith, county treasurer, and John J. Kelly, chief deputy treasurer. The result is a computer prepared tax bill which itemizes exactly where the individual taxpayer's dollar is spent, answering in advance any question on "where the money went?"

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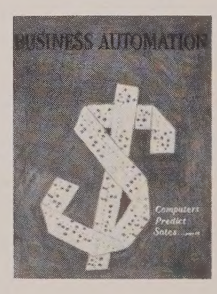

This month's cover

The relationship between electronic data processing and the sales dollar is symbolized by this sketched arrangement of paper tape by our art director, Leonard Schimek.

Another Achievement from Monroe:

secretary's desk?

No... a complete data processing system from Monroe for only $700 a month!

A fully transistorized, desk size, electronic computer, the Monrobot XI is the least expensive, complete data processing system yet devised. This is not a component. It is the entire system.

Data processing that every businessman can afford arrived with the advent of the Monrobot XI. For the large corporation, it allows decentralization . . . saves time . . . can be tied into large-scale systems. For medium and small sized businesses, its low price makes possible—for the first time—the cost saving and money saving economies of automatic data processing.

No larger than an office desk . . . requiring no special flooring or air conditioning . . . the Monrobot XI accepts input data from typewriters, punched tapes, edge punched cards, 80-column cards, teletypewriters and numeric keyboards—can process *any* machine language. Up to three input-output devices can be used simultaneously with the Monrobot XI—and it handles numeric and alphabetic data with equal ease.

On a typical weekly payroll, it performs all operations automatically and writes checks for *800 employees in an eight-hour day*. With the addition of input-output devices that cost less than $200 a month, it will do everything—from preparing the payroll journal to updating individual employee records—*all* in a one-pass operation.

What's more, it will substantially reduce processing time on almost *any* general business function—sales analysis, job costing, accounts payable—*you name it* . . . as well as handling such special jobs as stock and bond confirmations for brokerage houses with unparalleled accuracy and economy. *It is the least expensive complete data processing system ever devised.*

At this low price—$700 a month to rent, $24,500 to buy—the Monrobot XI almost demands investigation. For complete details, write us today.

MONROE

ELECTRONIC COMPUTER DIVISION, MONROE CALCULATING MACHINE CO., ORANGE, N.J. A DIVISION OF LITTON INDUSTRIES

For More Information Circle Reader Service Card No. 154

Paul McVicker, right, head of engineering records and reproduction at Chrysler Corporation Missile Division, points out to assistant, Jerry Cracchiolo, the high quality and contrast of a xerographic print reproduced by a Copyflo® 24 continuous printer *(inset, right)* from a microfilmed copy of original drawing. Each microfilm frame is mounted in a die-cut aperture of a data-processing card.

Chrysler speeds missile-drawing reproduction through xerography and unitized microfilm

The Chrysler Corporation Missile Division, prime contractor for the U.S. Army-developed Redstone and Jupiter ballistic-missile systems, is using a highly developed unitized microfilm system to speed the reproduction of thousands of *different* engineering drawings daily.

In a unitized microfilm system, original drawings are microfilmed and the individual microfilm frames mounted in die-cut apertures of data-processing cards. From the cards, dry, positive prints ready for immediate use can be turned out automatically by xerography on a Copyflo 24 continuous printer. The cards are maintained in a compact, readily accessible file.

At Chrysler, more than 3½ million drawings have been microfilmed and mounted!

The Copyflo 24 continuous printer operates on the electrostatic principles of xerography, and at a reproduction speed of 20 linear feet a minute. It enlarges microfilm frames to a maximum width of 24 inches on *ordinary paper*. The quality of reproduction is superb.

Chrysler's unitized microfilm system has achieved great economies in time, money, space, and materials. Working files, for instance, have been reduced as much as 95%, since aperture cards occupy only a fraction of the space needed for original drawings or conventional reproducibles.

You needn't have reproduction volume like Chrysler's to attain proportionate savings. You can set up your own unitized microfilm system on a modest scale that can provide significant savings. Why not let us show you how you can speed paperwork duplicating and save money? Write to XEROX CORPORATION (formerly Haloid Xerox Inc.), 61-182X Haloid Street, Rochester 3, N. Y. Branch offices in principal U.S. and Canadian cities. OVERSEAS: Rank-Xerox Ltd., London.

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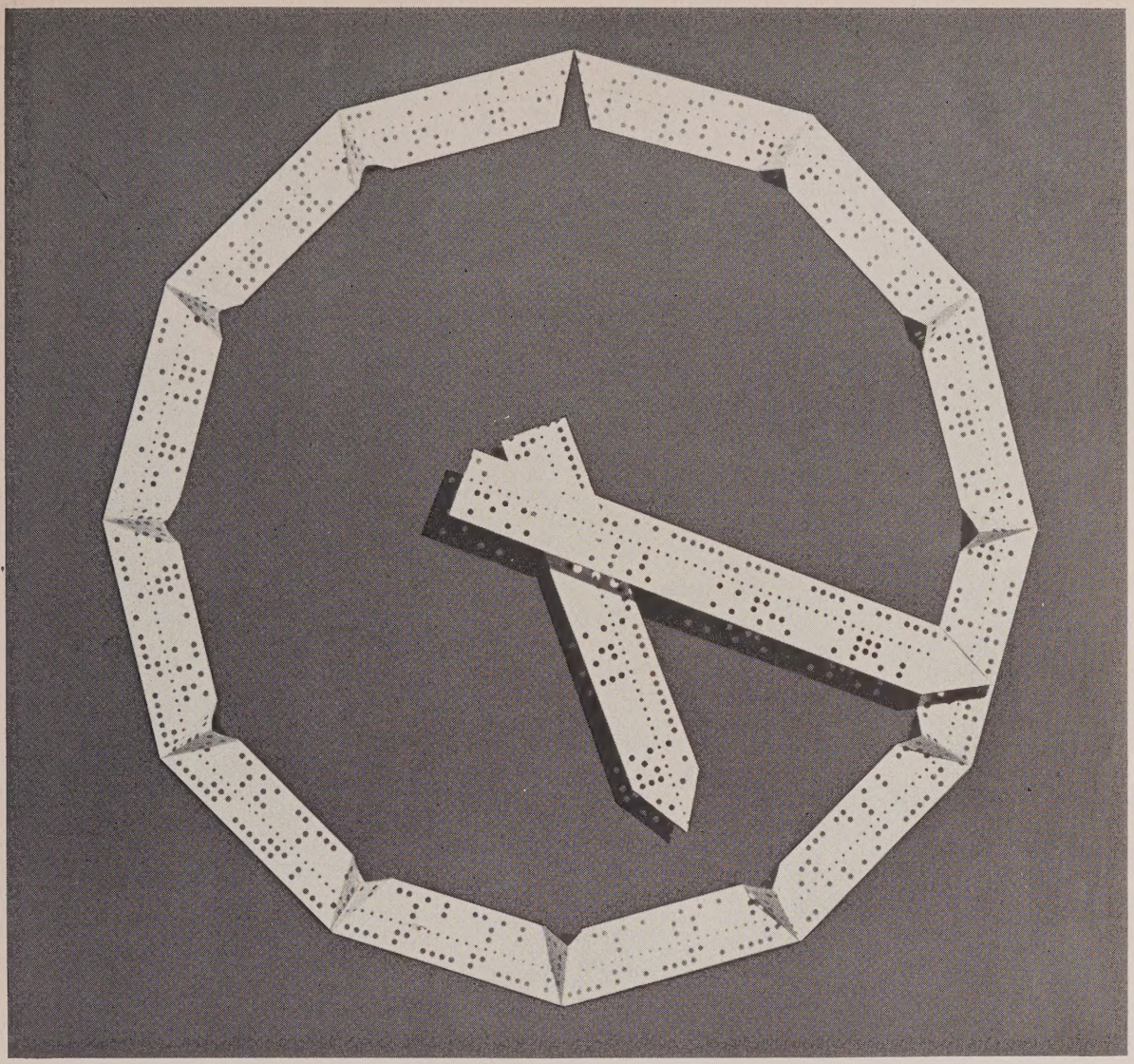

Now, you can get complete sales and inventory figures in hours!

How quickly can you evaluate current sales activity? And are you relying on inventory figures that are not complete? Chances are it takes you even weeks to obtain all required inventory and sales facts. Yet did you know: a National Electronic Data Processing System can give you all these vital reports in only a matter of hours! National Systems go *all the way* from the original entry—in cash registers, accounting machines, or adding machines . . . through the computer . . . and high-speed printer . . . to detailed final reports. You can now tell which parts of your business are paying-off; judge which ones could be doing better—all before the current picture changes. You can now get far greater executive command than was economically practicable before. In short, you can get *today's* figures *today*, while there is still time to evaluate results and take effective action. For more information, write today to National.

• Punched paper tape is created by National Accounting Machines, Cash Registers and Adding Machines as an automatic by-product of normal operation. It is then fed into a computer to produce, at minimum cost, the information you need for most profitable control.

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RANDOM ACCESS

Information bits from the Editor's memory file

Around The World In 80 Columns

The punched card, far from fading into oblivion, is actually becoming the common language of business around the world. In the United Kingdom, meter men of the Eastern Gas Board use cards to make up meter readings in their area; drivers of a Somerset transport company use them as work tickets to record details of their journey. In Switzerland, a punched card becomes your telephone bill, payable at any post office, and some communities use cards as a voter's certificate. In Holland, the card serves as a season ticket at the theatre; in Finland, as a pension record; in Brazil, a credit card.

Toronto police hand you a card for a traffic violation. If you were to emigrate to Costa Rica, the record would be kept on a card. For your ticket to a baseball game in Nicaragua, an auto license application in New South Wales, a lottery ticket in Sweden or a loan repayment in Japan, a punched card is the document. The exchange of punched cards between Thomas Cook and Son Ltd. and such organizations as the Compagnie Internationale des Wagon-Lits takes the place of rendering accounts. Other uses include round-the-world air tickets, personal checks drawn on a French bank and Italian gasoline vouchers. To supply international demand, one company alone—IBM World Trade Corp.—produces cards outside of the U. S. in 39 plants on six continents.

State-Federal Enterprise To Check Driver Licenses

A National Driver Register Service has been established by the Bureau of Public Roads of the U. S. Department of Commerce. The Driver Register, maintained on an IBM 1401 magnetic tape data processing system, is a file on motor vehicle operators whose driving privileges have been withdrawn for driving while intoxicated or for conviction of a violation involving a traffic fatality. The voluntary, cooperative State-Federal enterprise will enable states using the register to prevent the granting of driver privileges to individuals whose licenses have been withdrawn in another state.

Names and identifying data on drivers whose driving privileges have been revoked will be furnished to the Bureau of Public Roads by participating states. Once the operation gets into full stride, it is expected that records will be received on about 1,000 names daily and requests for searches could average 20,000 a day.

The Register Service began official operation on July 1, with 45 states and territories already agreed to participate. The Service will accept all media of data transmission, including manually prepared forms, punched cards, punched paper tape and magnetic tape. The Service will furnish, without cost, the forms to be used by the states or territories for reporting withdrawals and requesting searches.

Establishment of the Driver Register Service was authorized by legislation approved July 14, 1960, and was based on recommendations made to Congress in February 1959.

Processing checks with Magnetic Ink, including consecutive numbers, requires complete accuracy, signal strength and error-free results. Moore is well-qualified, by experience and facilities, to print magnetic characters and consecutive numbers perfectly. If you are planning new checks, talk it over with the Moore representative. He will give you the latest information, with design assistance that will assure you of positive results, with printing done accurately and economically. Ask him for a copy of our interesting 'Question and Answer Book about Magnetic Ink.' Build control with Moore Business Forms.

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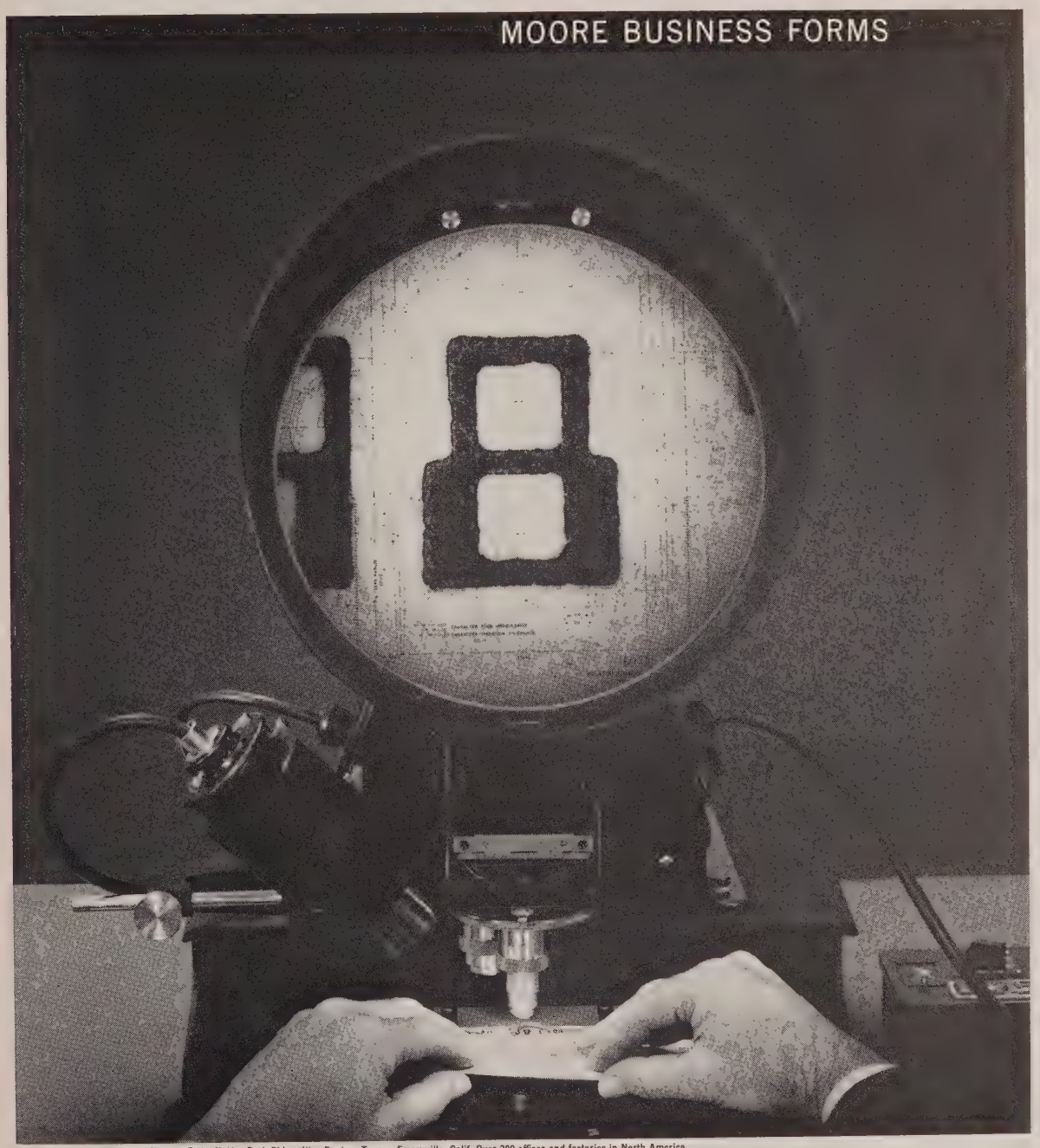

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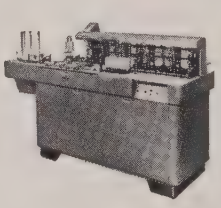

Place automated mailing into your **punch card billing** picture

How much is convenience worth to you? If you are already enjoying the speed, accuracy and economy of punch card billing, it makes sense to automate your mailing operations as well with a Phillipsburg Inserter. Here's a machine that can reduce mailing costs and eliminate costly errors like empty envelopes or missing sales slips. In a 7 x 11 space the Phillipsburg completes the picture of punch card billing and provides all the conveniences of a modern, mechanized mailing department. You, too, can now reach your customers at a moment's notice without disrupting your office or plant routine. And a mailing deadline, promptly met, is a measure of your service.

Write for complete information on automated mailing

The Phillipsburg gathers, nests, inserts, opens and seals envelopes, prints postal indicia, counts and stacks up to 6,000 pieces per hour.

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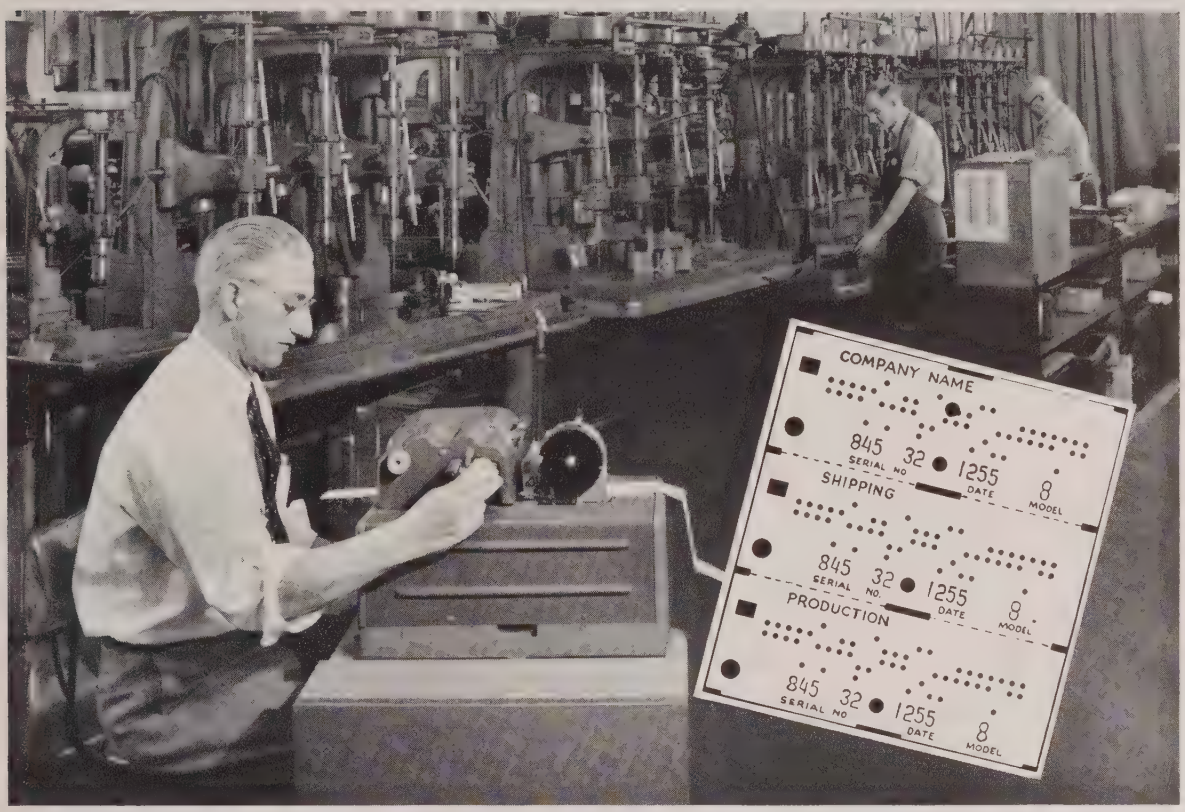
DATA PROCESSING THRIVES ON AN ERROR-FREE DIET!



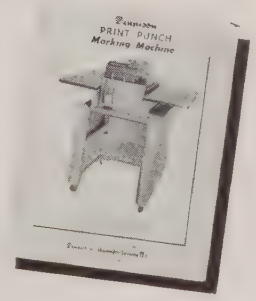
By recording information as it originates,
Dennison Print-Punch checks three common causes of input errors!

Minimizes manual recording! Smudged, illegible, temporary records never have a chance to infiltrate your tabulating room when portable Print-Punch Machines take over. Stationed where data starts, Print-Punch Machines create accurate machine-language records of all operations . . . from Receiving to Shipping and anywhere in between. Information takes only a few seconds to dial. Push a lever and 20, 25 or 31 column tickets come out printed and punched at speeds up to 300 stubs per minute.

Eliminates mutilated source documents! Small, durable Print-Punch Tickets travel along the production line with your product . . . withstanding abuses that damage larger, flimsier input media. Available serially or repetitively numbered in continuous strips of single or multiple stubs, Dennison Print-Punch Tickets can be tailored to fit almost any control or accounting system.

Reduces key punching errors and costs! Print-Punch Tickets are automatically converted to punched cards or punched paper tape without need for key punching. "Batch" machine-language records, created at the source by a single setting of a Print-Punch Machine, can often save hours and hours of key-punching time in the tabulating room. That's why key-punching costs shrink when Dennison Print-Punch goes to work!

Learn more about making your data processing more accurate with Dennison Print-Punch Machines and Tickets. Mail coupon today.



Dennison *Helping you compete more effectively*

Dennison Manufacturing Co., Machine Systems Division, Dept. V-98, Framingham, Massachusetts

Please rush your brochure on the use of Dennison Print-Punch Tickets and Machines for extending automatic data processing efficiency to inventory, reorder, production and inspection systems, payroll and cost accounting.

Name.....Title.....

Company.....

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City.....Zone....State.....

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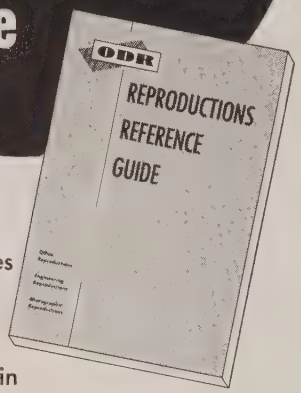
ODR Reproductions Reference Guide



The practical reference guide of the reproductions processes market. Designed to serve those interested in the reproduction services functions in business and industry. This 250 page guide is divided into two major sections: A management section and a Technical Section.

The following chapter subjects are indicative of the extent of editorial coverage:

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- Needs and Skills in Reproduction Services
- Blueprinting
- Paper Selection
- Electrostatic Printing
- Polyester Films
- Microfilm
- Line and Halftone Photography
- The Offset Reproduction Process
- Contact and Projection Reproductions
- Mechanized Collating; and Cold Type Composition.

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from the Publisher's Desk

A GREAT DEAL of interest is being focused on communication techniques these days, particularly in the magazine field.

Readers of *Life* witnessed a major transformation in the magazine's appearance a few weeks ago, the *Post* is about to receive a massive revamping, and a score of specialized business publications are touting new formats.

Frankly, we are a bit amused by it all because most of the "new techniques" which are coming to the fore are the same principles which our editors have been practicing since we started publication almost three years ago. Such things as extra-wide margins, full-page photographs and Roman-style headline type have been standard fare in BUSINESS AUTOMATION and will continue to be.

Why?

Simply because this type of format is easiest for the eye to read and the mind to comprehend. It observes basic rules of form and design that are ageless. It is utterly simple . . . and this probably is why so many well-meaning editors and publishers have strayed away from it.

In an era when executive reading time is at a premium, we feel you are entitled to the best means of printed communication known. And we're delighted to see these basic principles of layout and page design now being adopted by many other fine publications.

Charles W. Gilbert

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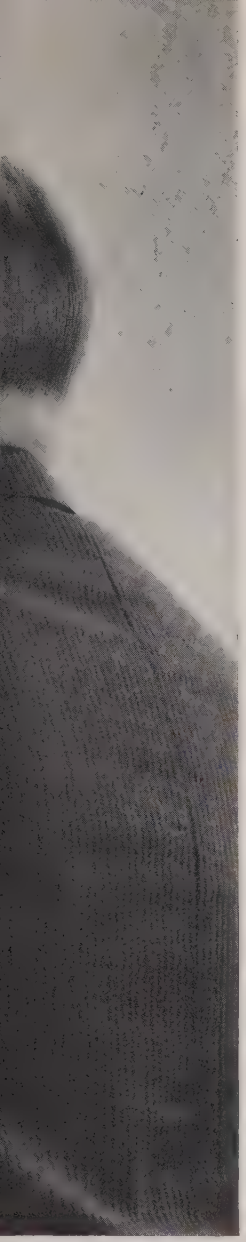

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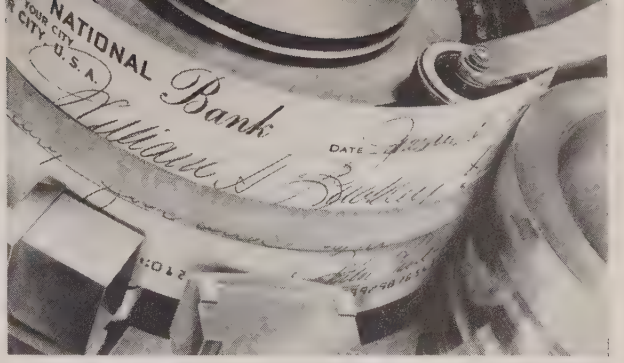

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Letters

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We must recognize the fact that every profession owes to its community the duty of advising the community of the needs emerging from the profession. The impact of automation on office employment is a specific example of the type of information challenge we all face if the American public is to be properly informed on the impact of our efforts.

W. T. Cavanaugh
Executive Director
National Office Management Assn.

Dear Sir:

I would like to compliment you on your very fine article "Automation—The Job Maker," in the April issue. I think the article does a fine job of refuting Representative Holland's unsubstantiated allegations. Naturally, we are delighted that our picture and information was incorporated in this story.

We would like permission to reprint the article for the purpose of including it in our catalog materials that are mailed to prospective applicants.

Reese V. Pair
Vice President
Automation Institute

Dear Sir:

You'll have to work very hard to surpass your June 1961 issue of BUSINESS AUTOMATION. Congratulations.

The USSR story is excellent, and your editorial on the "Crisis in Machine Accounting" is tops. You will get many comments on this editorial, I am sure. Continued success to you.

F. J. Ring
President
Business Forms International

Dear Sir:

I would like to thank you for permitting us to reproduce and circulate your excellent article, "Crisis in Machine Accounting," throughout our command.

Kenneth J. Palmer
Chief, ADPS Branch
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Office of Controller
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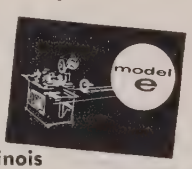

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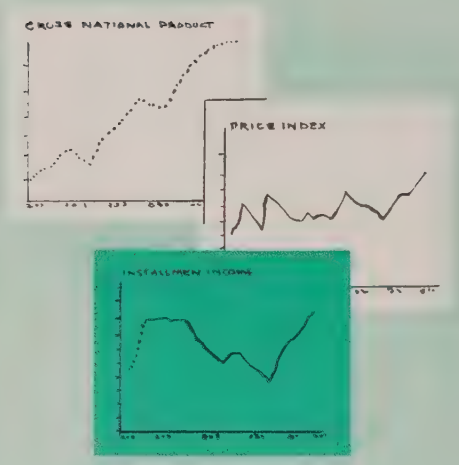
The Sales Forecasting Process

Basic sales forecasting steps are illustrated by the following diagrams. Step 1: The management forecasting group selects historical sales information and general economic data, such as Gross National Product and population indices, for computer input. Step 2: Computers select particular indices which most correctly resemble the company's historical sales pattern. The result is a forecast which management may compare to validating criteria. Step 3: The evaluation process leads them to select the most significant indices; then steps 1 and 2 are repeated until a satisfactory validation is obtained. Step 4: The company's forecasting model is then functional and flexible for profitable sales forecasting.



History and Statistics

Computers Predict Sales

Sales history, computers and management judgment create a scientific model for profitable sales forecasting.

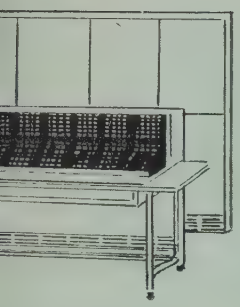
By Arthur A. Katz

ONE of the nation's largest manufacturers of home television receivers has been using an electronic computer and advanced model-building techniques to forecast national sales. The company, Radio Corporation of America, has been amazingly accurate in preparing these forecasts; predictions of black-and-white TV sales have been accurate within two percent.

In any business, sales forecasting requires sensitive decision-making leverage. An entire company's resource of men, money, material and machinery can be affected enormously by changes in forecasting. Some irreversible decisions, such as plant expansions, often rely on a high degree of accuracy in sales forecasting.

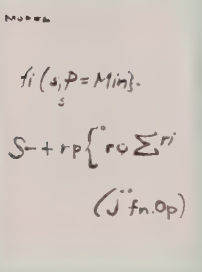
The opportunity to take full advantage of economic order-quantity purchasing or economic production runs is firmly seated on good sales forecasting. Improved production planning and the reduction of overtime and employe turnover can be achieved through better forecasting. Financially, inventory investment and the efficient flow of cash are solidly linked to the future sales estimate. All of these lead to a better profit picture.

All of these benefits contribute to management



Computer

Management Evaluates Selected Indices



Computer Model

Sales Forecast

efficiency and indirectly are a competitive advantage. More direct competitive gains are achieved on the salesman's level by the improved customer service which accurate forecasting allows.

Throughout business and industry, management is faced with the problem of making recommendations on how to boost production, capture new markets, increase sales volume and extend company operations in general. For these decisions to be really profitable, management must have an accurate, reliable sales forecast.

"Guesstimate"

If all organisms were classified on the basis of their ability to forecast, the graduation would closely resemble a scale of superiority. If this same predictive criterion were used to classify the businesses in a given industry, it should yield a scale of superiority similar to a classification by share of the market.

In business, however, there are other factors to be considered, such as patent rights, stage of growth and efficient use of predicted data by management, which could cause inconsistencies within our hypothesis.

In the main, however, it is clear that accurate prediction is significantly related to economic survival in a competitive situation.

Many companies have adopted the practice of "standard cost." This points out significant deviations of actual cost from some standard which, in essence, is a forecast of cost based upon past cost behavior.

Even though a system of standard costs is expensive to institute and maintain, few important decisions are based on it. Some pricing considerations and perhaps some "make or buy" decisions are based on standard cost, but it is primarily an after-the-fact consideration concerned only with past history.

Without the realization that they are doing so, people are forecasting all the time. A housewife who is making up her weekly grocery list is forecasting her family's food consumption. A company's recruiting schedule implies a forecast of its workload. A man who is packing his suitcase is forecasting his needs away from home.

The accuracy of the method used to prepare these and other forecasts is measured by how well they can predict future events.

In his book, "Human Use of Human Beings," Norbert Wiener suggests that organisms might be classified by their ability to forecast. A cat catches

a mouse because it can predict where the mouse will be at the time his paw reaches it. If the mouse could realize this fact and predict where the cat's paw would be, perhaps he could elude it.

The earliest and simplest method of producing a sales forecast is by "guesstimate." This intuitive technique has been used by companies with varying degrees of success. But because of the highly subjective nature of the method, its success is largely dependent on the person making the forecast. As a company becomes more complex and diversified, it is less than reasonable to expect a human being to absorb all of the details and considerations needed to produce accurate forecasts.

The most important ingredient in the "guesstimation" technique is the history of past sales. Some sophistication has been added to this method by extending historical sales into the future by a linear approximation. The "least squares" method was applied to historical sales data to "fit" it to a straight line, and then this line was extended into the future to estimate sales.

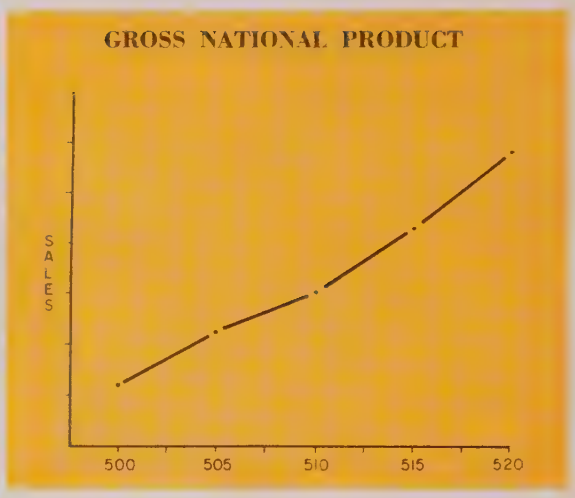
Past history, however, is not the only factor that can affect future sales. Other forces in the economy seem to make themselves felt despite any historical trend. The real problem of the forecaster is to measure the effect of these forces.

Shape a real ship

Certain statistics such as Gross National Product (GNP), Price Index and Income have been developed to quantify the economic and social forces at work in the economy. Through the technique of correlating these statistics, it is possible to statistically measure their relation to sales; but the calculations necessary to do this are very long and complicated. There are any number of possible related indicators and it becomes an enormous task to perform the necessary correlations. Unfortunately, much effort is wasted in testing the various combinations, translations and transformations of a set of indicators, only to discover little or no correlation at all. If continued, this process becomes costly and time-consuming.

For these reasons, the powerful analytical tool of multiple correlation analysis has been given only limited business application.

With the advent of the Computer Age, practical applications of many scientific approaches became possible. Attempts were made to take full advantage of these techniques and to utilize the high-speed facility of computers. But early results were not always successful in business areas because



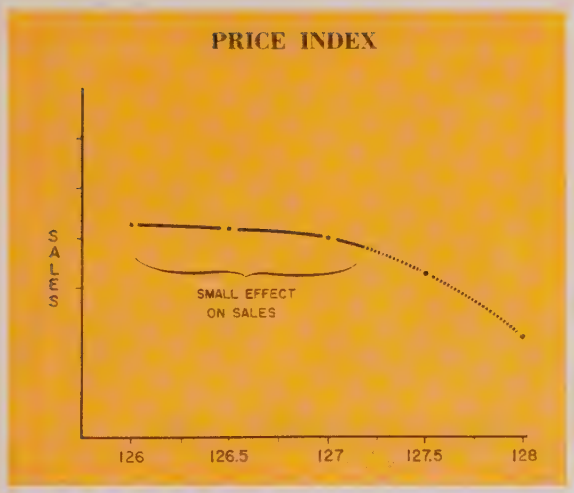
personal judgment was not an integrated part of the system. In many instances, the attempt was made to substitute speed and mathematical elegance for years of management skill and judgment.

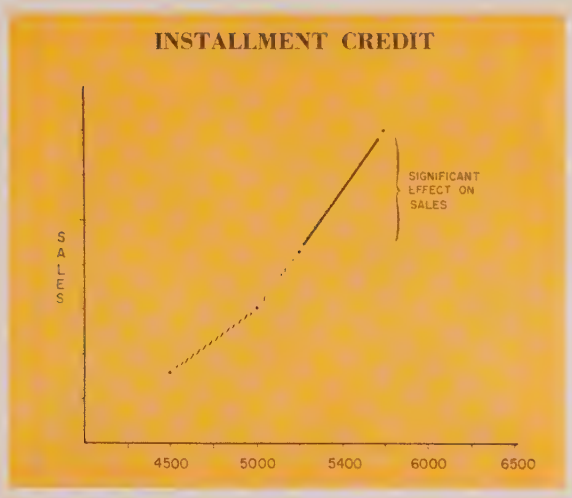
All the previous methods of forecasting were, in a sense, attempts to design a model of company sales. The design has taken shape in the same way a skilled woodcarver might model a ship. His first guess yields nothing more than a block of wood of general shape and size. He compares this with the real world and decides that more detail is desired. He continues to cut and shape in finer and finer detail until his model resembles the lines of a real ship. This is a feedback system; the model maker is continually making finer and finer adjustments, always comparing his answers to the real world.

A rough block of wood

RCA has developed a computer method which not only investigates the correlation possibilities of a given set of indices, but also selects and weighs the most significant factors. This method was built into a feedback system which was open-ended to include management evaluation in a dominant role. Thus, it applied the time-tested model-making approach to the forecasting problem.

Since February 1960, RCA has been utilizing this highly-advanced, electronic method of predicted sales, based upon well-known, but previously impractical, formulae.





These three graphs represent the effects on sales of fluctuations in Gross National Product, Price Index and Installment Credit. The significance of these indices are determined by a computer's extensions as related to past sales statistics. Note that a wide variation in the estimate of Price Index has little effect on future sales; a small deviation in Installment Credit, however, will seriously change market activity.

The system is initiated by the model maker (in this case, a member of management's forecasting group), who submits a rough approximation to the computer by selecting an historical series of economic or demographic indices such as population or GNP. This initial selection is based on his years of experience and skill, and represents his judgment of which indices affect the company's sales. This gives the computer a rough block of wood to operate on.

The computer statistically cuts and selects from this set of data those particular indices which most closely resemble the historical sales pattern of the company (see illustration). The forecast which the resultant model yields then is compared to actual past sales and is projected forward.

Management then can examine this model by comparing it to some validating criteria. Often, this, is accomplished by withholding the previous year's sales from the input of the computer and then examining how well they would have been forecasted by the model.

If this comparison shows a deviation, the model maker has several options. He can submit a new set of indicators, change the present set by some transformation, provide different combinations of indices, or make any number of other modifications. This data is then re-cycled through the computer and the ensuing output is examined.

Management continues to build models in this way until the resulting model is, in its judgment, a true reflection of the marketplace.

The computer thus becomes a practical, usable tool of management, easily controlled so that fine adjustments can be accomplished. It is management that supplies the judgment, the economic indicators and the pattern of historical sales. The computer program performs the routine, complex statistical analysis, while management guides its powerful "cutting edge."

This by no means exhausts the analytical possibilities of the man-machine system.

Variations on an index

After management has built an acceptable model, it then must supply the predicted levels of the selected indices. For example, let us assume a large appliance manufacturer wishes to design a model of his market. Through his experience, he decides that population, GNP, Discretionary Income, employment and new construction should have some influence on his sales. He then decides that the last six years of his sales (1955-60) are typical and that he will use them as a pattern. His input to the computer then is:

ANALYSIS INPUT: Company sales for 1955 through 1959 (1960 sales are withheld to be used in testing the model's forecasting accuracy). The historical levels of population, GNP, Discretionary Income, employment and construction.

FORECAST INPUT: The 1960 level of GNP, Dis-

cretionary Income, employment, construction and population.

In less than a minute, the computer will printout the forecasted sales for 1960.

On such a small problem as this, it is more efficient to prepare many variations of the data. For example, the problem may be repeated using a relationship between GNP and the Cost of Living Index, rather than GNP alone; employment as a percentage of the total labor force, rather than an absolute figure; or the logarithm of the data (this option is programmed). More important, parametric analyses easily may be performed with this program. The future estimate of GNP, for instance, might consist of a low estimate, a medium one and a high one. The same may be true of Discretionary Income levels. Much important insight can be gained by submitting an initial series of problems designating various combinations of these estimates.

A simple graph showing the results of these problems contributes further to our understanding of the sales picture. This analysis should reveal other possible variations of indices or possible new candidates for economic analysis on the second computer run. This is the important feedback characteristic which integrates management's skill and knowledge with this important tool.

Continued analysis by management and comparison of forecasting levels for validation will result in better understanding of the forces which affect sales and will supply more accurate and rapid forecasts on which to base decisions.

RCA used this forecasting technique on Election Night, 1960. The result is now a matter of historical record.

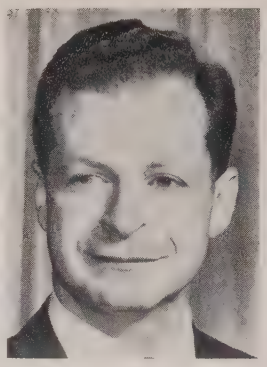
The RCA team took advantage of historical voting patterns and prepared a comprehensive analysis for use in extending Presidential trends. The analysis concerned itself with many demographic factors. Proper weight and consideration were given to such things as regional variance, economic status of the voter, percentage of unemployed and percentage of urban vote. Using these characteristics and a very comprehensive model, RCA was consistently correct on Election Night.

The RCA Sales Forecasting Package also has been made available to all users of RCA 501 computers.

In business and government operations where long-range decisions depend upon the accurate analysis and interpretation of social and economic statistics, the forecasting technique may help yield meaningful results.

The efficient utilization of this forecasting program promises to provide management with a sure, rapid method of obtaining accurate forecasts from minimal data. Such forecasts offer a sounder base for decisions and contribute enormously to more effective and more sensitive management controls. ■

About the Author



Arthur A. Katz is Manager, Applied Programming, RCA Electronic Data Processing Div., where his duties include responsibility for advanced programming, data processing methods, physical science and management science and their application to the RCA line of all-transistor computer systems. He was RCA's project manager for "Operation Ballot," the system used to project 1960 Presidential election results over the NBC-TV network. A member of the Assn. for Computing Machinery and the Institute for Management Sciences, he holds a B.A. degree from Colby College and an Electrical Engineering degree from New York University, and has done graduate work at the University of Pennsylvania.

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AMERICAN TYPE FOUNDERS Business Equipment Division

This article begins a series of personality sketches about leaders in the data processing field and their accomplishments.

Tom New of Westinghouse

By Arnold E. Keller

YOU CAN BE sure that most of the business system at the huge East Pittsburgh Divisions of Westinghouse Corporation have a new look about them—a Tom New look.

Prior to May 1 when New was promoted to the office of manager of accounting, East Pittsburgh Divisions (largest of all Westinghouse facilities), he was the manager of their Business Systems Department. In that capacity—one that he held since 1956—New directed a staff of some 160 people and was responsible for office services, operations research, office systems and data processing. The latter involved a multi-million-dollar computer center, one of the most powerful in the world (see BUSINESS AUTOMATION, Mar. '61, p. 55).

This center, which East Pittsburgh officials describe as "a combination scientific-commercial data processing center second to none in industry," contains a Univac I, an IBM 7090, three large analog computers, an automatic data plotter, a Collin's data transmission system and a variety of conventional punched card equipment.

The Univac I, installed at East Pittsburgh in 1956, marked Westinghouse's initial use of computers for business management. It also marked a milestone in Tom New's systems career. He had joined Westinghouse in 1941 as a member of the accounting department at East Pittsburgh. He later was transferred to the Buffalo, N. Y. plant, where he held various supervisory assignments in the accounting operation there.

In 1947, he was appointed coordinator of office methods at Buffalo and, in addition, assumed management responsibility for the tabulating department. It is interesting that the latter role was taken on without prior technical knowledge in machine accounting operations. Nevertheless, he was responsible for many pioneer applications in the areas of accounting, inventory control and factory management.

In 1953, New was transferred to the controller's staff at corporate headquarters in Pittsburgh and was assigned the task of evaluating large-scale computer possibilities for Westinghouse. His conclusions: automation of the clerical operations involved in payroll, inventory control and sales analysis at the East Pittsburgh division would be a payoff proposition for a computer. At that time, Univac was virtually the only commercial computer with a proven record in business applications and it was recommended for the East Pittsburgh project.

In making his recommendations, New rushed in where, even today, systems "angels" fear to tread. He predicted that a "break-even" point would be possible after six months of operations.

Considering that the proposed system involved a payroll of 20,000 employes, automatic control over 34,000 inventory items, and reporting and analyzing over 90,000 monthly sales transactions, there were many who looked upon the six-month prediction as outright insanity.

East Pittsburgh "bought" the project, on the condition that New would be transferred to the division and supervise the installation. This was done.

One unforseen complication posed a serious threat to the conversion schedule. Just a week after delivery of the Univac, Fall 1955, a general

Tom New and Ed Fax, staff assistant to the controller, discuss program for the Univac I. Westinghouse installed the computer in 1955.

strike closed Westinghouse operations for five months. Fortunately, U. S. Steel had a Univac installation and New, along with his staff of 12 programmers, was able to use the machine on the third shift to debug and test his programs. Because records of salaried employes already had been transferred to magnetic tape, New also was able to process the salary payrolls for East Pittsburgh on the U. S. Steel computer.

The strike ended in the Spring of 1956 and Univac became an integral part of the East Pittsburgh operation. Six months later, as New predicted, the computer operation reached the break-even point. A large part of the clerical force was freed for other operations, and the speed and accuracy of the computer made for more efficient inventory and sales reporting.

New attributes a large part of the Univac success at East Pittsburgh to John McCrea, whom he describes as "one of the most skilled programmers in the United States." McCrea came to Westinghouse and New's staff from Remington Rand, where, among other accomplishments, he was responsible for programming the Univac forecast of the 1952 Eisenhower election sweep. This was the famous computer projection—later proved 100 percent accurate—that was made at such an early hour on election night that both Remington Rand and television officials were afraid to release it.

McCrea, who now heads the East Pittsburgh data processing operation, developed many computer "sort" and "merge" routines that are common to the industry today. Some of these routines, programmed in 1955 and earlier, still are among the fastest in existence.

Along with New, McCrea performed early development work on some of the Remington Rand automatic programming techniques.

"King for the day"

Westinghouse quickly outgrew the capacity of the Univac I and, in 1956, acquired an IBM 704 to handle some of its scientific applications. When the IBM 7090 was announced, New recommended that East Pittsburgh replace the 704 and combine the scientific and business data processing functions on the more powerful computer.

The suggestion was adopted and the 7090 was installed last January. It originally was thought that the Univac I also might be phased out as this transition to a new computer proceeded. Due to continued growth of computing requirements, however, New and his staff are debating whether it might be more advisable to replace the Univac I with a Univac III.

Another of New's major accomplishments has been the establishment of clerical standards

The recent addition of an IBM 7090 to already existing equipment makes the Westinghouse data processing installation one of the most powerful in the world.

throughout the East Pittsburgh operation. Starting in 1957, he assigned a crew of time analysts to set standards for the various clerical jobs. The program took three years and the jobs of 3,000 salaried employes were reviewed. Some 1,800 were found susceptible to standards, which became part of the budget for the department involved. Even the engineering departments were surveyed to determine what portion of the engineers' time was devoted to clerical tasks. A substantial improvement in work flow and expense figures has resulted from the initial study. New's staff now is making a second round of studies, which will be more detailed and is expected to produce additional improvements.

Under New's direction, Westinghouse pioneered the technique of using microfilm to automate the processing of engineering drawings (see BUSINESS AUTOMATION, Jan. '59). The system, which went into operation in 1958, resulted in over a million engineering tracings being "retired" as microfilm and punched cards took over. Officials at East Pittsburgh credit the system with greatly increasing the efficiency of the engineering department, due mainly to the tremendous reduction in time necessary for an engineer to obtain a particular drawing from the file. The microfilm system is still a model for the industry and is the reason for many plant visitations each year.

New's five-man operations research staff has programmed a business simulation game which has aided in the training of nearly 800 management personnel at East Pittsburgh. New describes the game as "King for the day" and says that it is similar to the American Management Assn. game except that it is based on a job shop type of program.

New's formula

Other projects of the operations research group include simulation of a new production control system and experiments with information retrieval programs. The simulator on production control presently is being used to acquaint management with the future system. The retrieval system includes an engineering data retrieval program, patent retrieval and employe history retrieval.

Because engineering is a dominating factor in the Westinghouse corporation, it is only natural that a good share of computer time is devoted to engineering problems. At East Pittsburgh the engineering department rents blocks of time from the computer center and handles all of its own programming.

Tom New has been associated with the Univac Users Conference since its beginning in 1955. He

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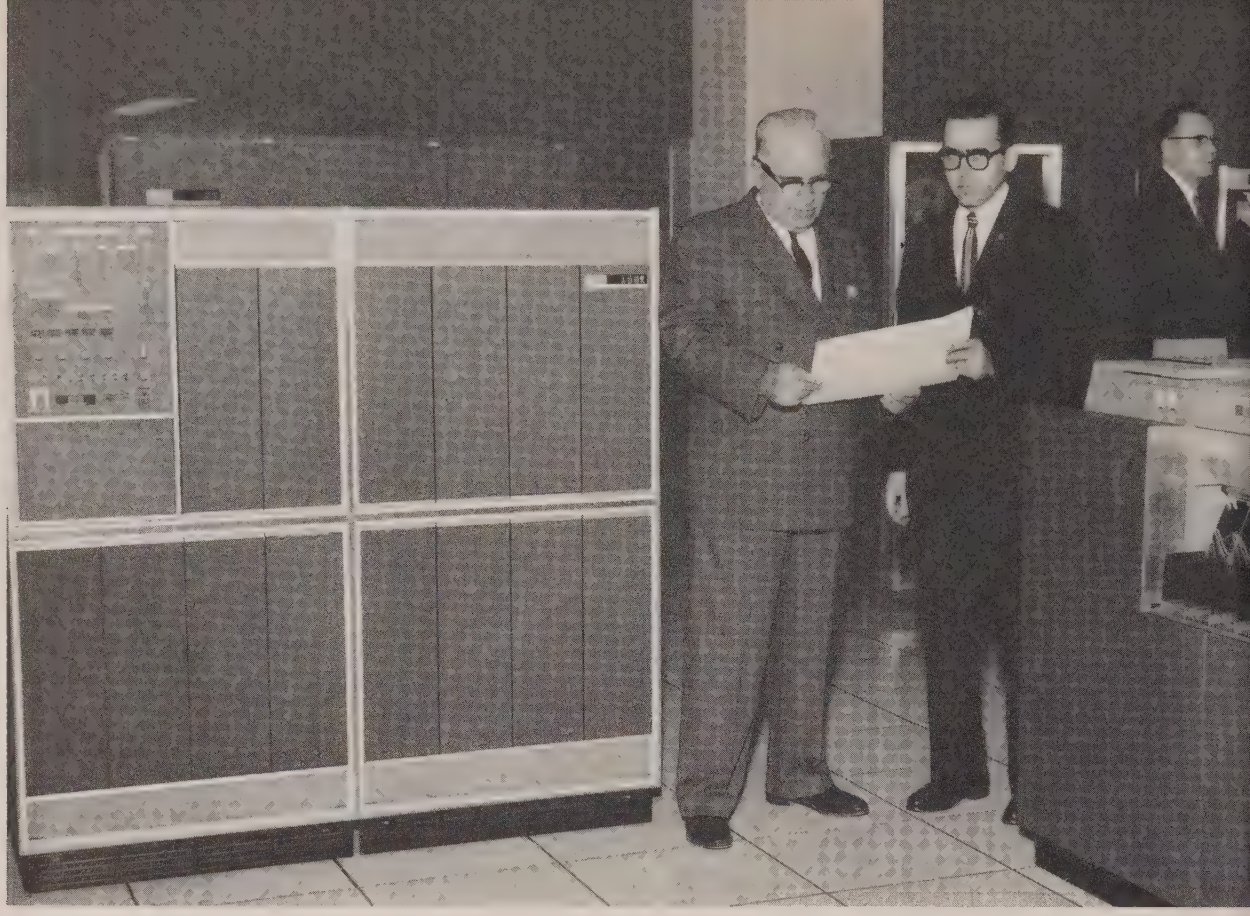


Creators of the Du Page County tax procedure are John J. Kelly, chief deputy, and Donald R. Smith, county treasurer (right), who are looking over output from an IBM 1401 computer.

County Computer Itemizes Taxes

By Don Young

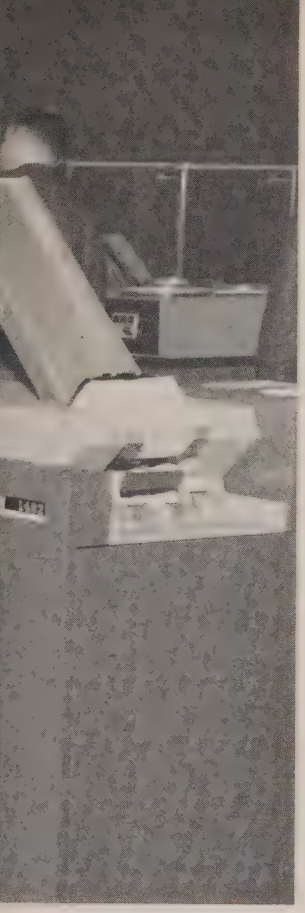
IN Du Page County, Ill. (just west of Chicago), a progressive County Treasurer has harnessed the speed and efficiency of an electronic computer to show taxpayers exactly where their tax dollars are going.

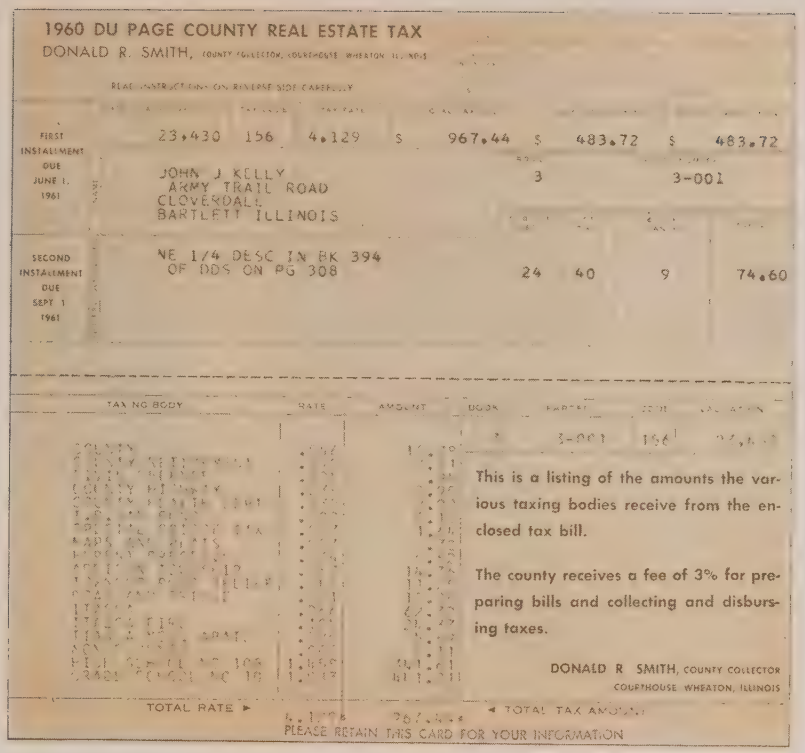
The result: Du Page residents probably are the best-informed taxpayers in the country. They have a better idea of who's spending their tax money, why their tax dollars are important to the operation of the government, and how to vote intelligently on important tax proposals that arise throughout the year.

Whenever a Du Page resident receives a bill for Real Estate or Personal Property taxes, it indicates not only the total amount of the assessments he must pay, but it includes an item-by-item breakdown of where every penny is to be spent (see example, right). The figures he receives are not presented in hard-to-understand percentages, but in actual dollars and cents, individually computed to account for every penny of his own, personal tax bill.

If the taxpayer owes $1 worth of taxes, for example, he knows that precisely so much of it goes to local schools, so much to the fire department, and so much to county government (in the example illustrated, just a little over one cent on the dollar). He also finds out exactly how much he's paying for such things as civil defense, highway maintenance, poor relief, forest preserve maintenance, mosquito abatement, etc.

Created by Donald R. Smith, county treasurer; John J. Kelly, chief deputy treasurer; and Robert Schraft, county data processing supervisor, this unique program was initiated on a test basis last year, when 3,500 taxpayers—residents of one of the county's smaller townships—received similar tax breakdowns. Using an IBM 602A, 402 and





1960 DU PAGE COUNTY REAL ESTATE TAX
DONALD R. SMITH, COUNTY COLLECTOR, COURTHOUSE WHEATON ILLINOIS

FIRST INSTALLMENT DUE JUNE 1, 1961	23,430	156	4.129	$ 967.44	$ 483.72	$ 483.72
	JOHN J KELLY ARMY TRAIL ROAD CLOVERDALE BARTLETT ILLINOIS				3	3-001
SECOND INSTALLMENT DUE SEPT 1 1961	NE 1/4 DESC IN BK 394 OF DDS ON PG 308				24 40	9 74.60

TAXING BODY	RATE	AMOUNT	BOOK	PARCEL	CODE	VALUATION
[illegible]	[illegible]	[illegible]	[illegible]	3-001	156	[illegible]

This is a listing of the amounts the various taxing bodies receive from the enclosed tax bill.

The county receives a fee of 3% for preparing bills and collecting and disbursing taxes.

DONALD R SMITH, COUNTY COLLECTOR
COURTHOUSE WHEATON, ILLINOIS

TOTAL RATE ► [illegible] ◄ TOTAL TAX AMOUNT

PLEASE RETAIN THIS CARD FOR YOUR INFORMATION

Typical of the new tax bills as they are received, Kelly's current statement is a two-part card form showing assessments on his 74-acre, $23,430 farm (assessed at approximately 55 percent of real value).

407, the job required 90,000 punched cards and took one full week to accomplish.

Response to the idea was exceptional. Immediately, plans were made to implement the program on a county-wide basis this year.

Obviously, however, existing equipment was much too slow to handle 234,000 tax bills. Smith contracted for the installation of a new IBM 1401 computer to replace the three older machines and Schraft immediately began to program it.

This is no gimmick

Programming involved a special set of tax rates for each taxpayer, using the rates assessed by 306 different taxing bodies in a myriad of overlapping taxing districts. Individuals living across the street from each other might be in the same school district, but different sanitary districts; the same forest preserve district, but different school districts; and so on.

Each of the 463 tax areas in Du Page County has different configurations. Therefore, in effect, Schraft had to combine 463 different "programs" into one. On the average, each tax bill is made up of assessments from 18 different taxing bodies.

The job called for a program which would accept punched card input reflecting the taxpayer's name, address, tax code, property description (for Real Estate taxes) and dollar evaluation, and from that data determine the total tax assessment. Then it should compute and print out the assessments for each individual taxing body, subtracting each one from the overall total until all pertinent assessments are itemized and a zero balance remains.

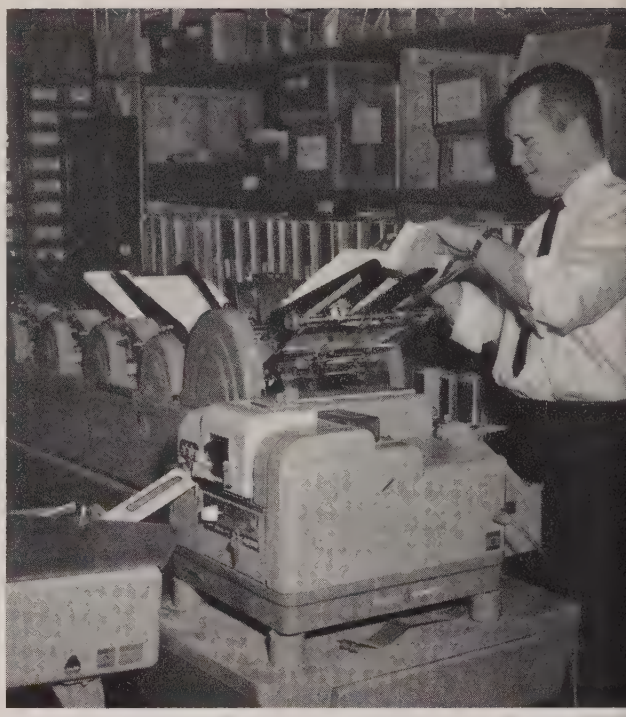
Because taxpayers are allowed to pay their bills in two installments, if they prefer, the tax statement had to indicate the total in two equal installments as well as the lump sum.

Schraft's program utilized all but one bit of the computer's memory, but the use of the highspeed 1401 accomplished the billing job 16 times as fast as the previous method, turning out individual tax statements at the rate of 32 per minute.

All 234,000 bills were prepared by the computer in just one week. The 1401 operated 24 hours a day, making over 6¾ million computations and printing over 7 million lines of type.

The computer prepares the bills in two copies, one for the taxpayer and one for the files. The taxpayer's copy is printed on punched card stock; the

Every taxpayer has a punched card in the county files. Throughout the year, these must be maintained for accuracy between billing periods.



Even the mailing of the county tax statements is mechanized. Automatic mailing equipment stuffs, seals and stamps all outgoing mail.

file copy is simultaneously printed on paper stock.

When the taxpayer receives his bill, it is in two parts—a bill, which is to be returned to the Treasurer's office when payment is made, and the itemized breakdown, which is a tear-off to be retained by the taxpayer for his own reference.

The back of each bill is pre-printed with information showing the due date of all tax payments (whether made in a lump sum or in two installments), penalties for delinquencies, where the bill may be paid, and how to notify the Treasurer if there has been any change of address, etc.

Since Smith was anxious to get the new procedure in effect as soon as possible and since his computer could not be delivered until early next year, this year's tax bills were prepared by a 1401 in the Chicago branch of the Statistical Tabulating Corp. Although this necessitated the transfer of thousands of punched cards from Wheaton (the Du Page County seat) to Chicago, 30 miles away, the entire operation was handled without any delays, lost or mutilated records, etc. The county rented computer time only from the service bureau; all other work was done in its own data processing department, as it will be in future years.

"The presentation of this new tax billing form is no gimmick," says Smith. "It's something we think every taxpayer is entitled to and it's a big step in educating the taxpayer in the affairs of government. I think the idea will spread and become a new standard among counties all over the country."

A taxing detail

Since adopting this new tax billing procedure, Du Page County has been visited by representatives of city and county governments throughout Illinois, Indiana, Tennessee and Missouri, all anxious to study the merits of the plan. When the State of Illinois holds its annual county officials' meeting in Chicago this month (August 13-16), a model installation patterned after Du Page County's and will demonstrate their taxing procedure.

The Du Page County Treasurer's office has used modern methods and equipment since 1956. Peripheral equipment in the data processing department includes a reproducer, three sorters, an interpreter, a collator, five keypunches and a verifier. Stuffing and stamping the tax bills is accomplished on automatic mailing equipment.

"This new form of tax bill helps taxpayers better understand the economics of government by showing them where their money goes—not in percentages, but in actual cash," says Smith. "It helps to keep government on its toes and it makes democracy work better." ■

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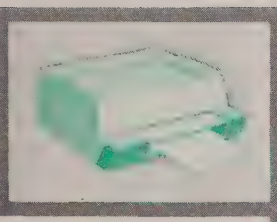

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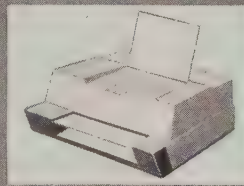

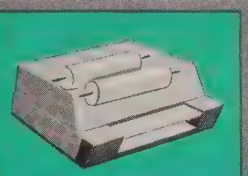

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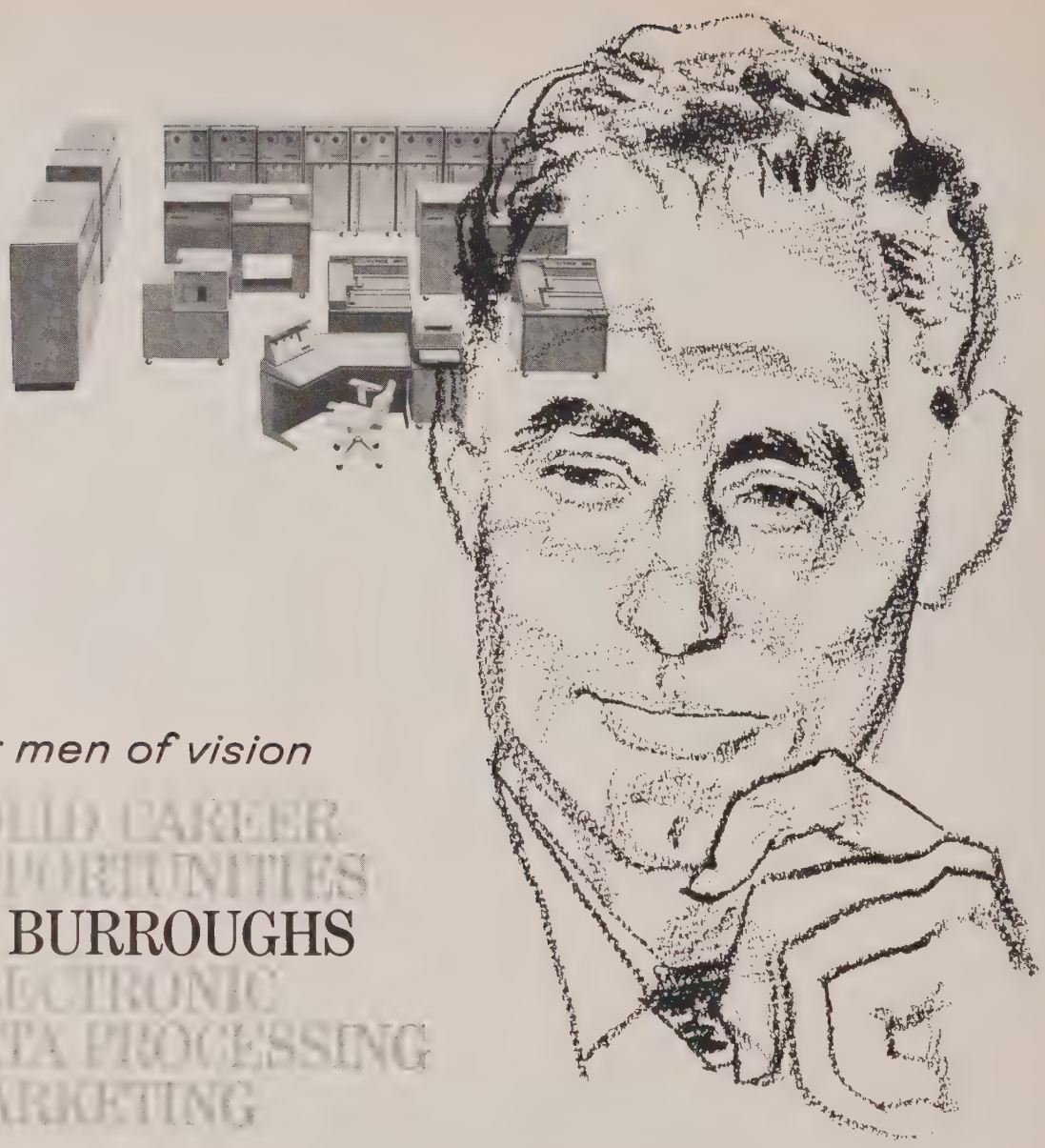

For men of vision

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For More Information Circle Reader Service Card No. 170

Tom New

Continued from Page 29

was president of the group in 1959 and served two years, during which he helped increase the membership from 75 to 250. His successor is another Westinghouse man, Don Houghton of the headquarters business systems department. New also belongs to the "Share" group, an organization of men and women responsible for IBM 7090 operations.

New received his education at Duquesne University, Pittsburgh, graduating in 1939 with a Bachelor of Science degree in Business Administration. He continued his education at Canisius College and the University of Pittsburgh. He now teaches an advanced course in EDP at the University of Pittsburgh, where he has served on the School of Business Research staff for three years. The EDP course uses an IBM 7070 in its laboratory sessions and also includes the systems principle associated with data processing.

Tom New's family life also has been a busy one. He and his wife enjoy a family of seven children, ranging from three to 18 years of age.

Last year, when Pennsylvania's Governor, David Lawrence, requested Mark Cresap, president of Westinghouse, to supply an individual to serve on the Governor's technical advisory committee for data processing in the state department, New got the appointment. In this capacity, he joins a group of 10 experts, chosen from major industries and universities within the state to serve as consultants to the Governor on EDP.

New's "formula" for a good systems man is a high degree of imagination and intelligence, coupled with the proper personality to "sell" the system. He credits the computer for having done much to change the traditional concept of systems operation.

"Prior to 1955," he says, "systems was a dumping ground for aging personnel and for those who didn't progress in other areas. Now it is attracting bright, young college graduates, and offers a future every bit as bright as in engineering, finance and other professions."

New believes that the future will see the business systems manager as the "right arm" of top management, both at the operating and at the corporate levels.

According to New, common failures of many systems managers are, (1) not to surround themselves with top notch people and (2) not to delegate responsibility. His philosophy is: "Managers don't do it themselves."

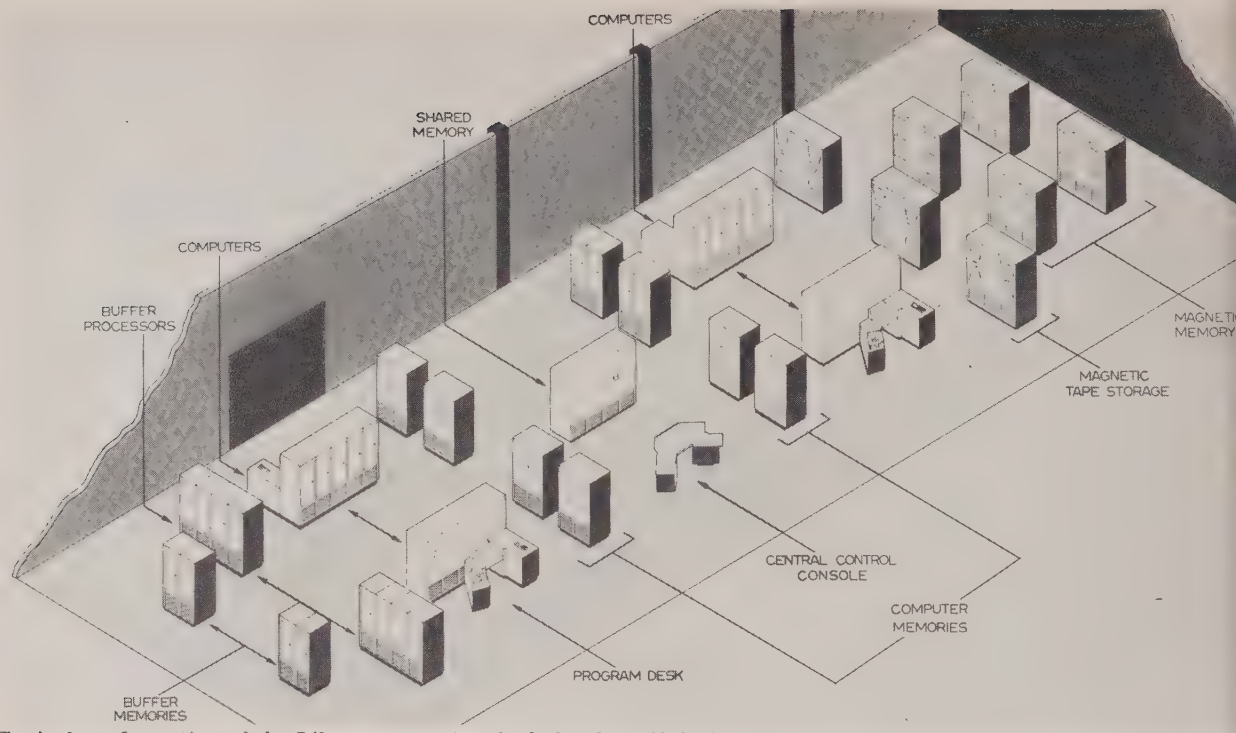
It would be difficult to quarrel with New's philosophy, for it certainly has been a successful one. How successful is indicated by his latest promotion, which is manager of accounting at the East Pittsburgh Divisions. In this capacity New directs a staff of 380 accountants, in addition to other personnel, and he is responsible for financial operations in plants at Bloomington, Ind.; and Derry, Irwin and Trafford, Pa. He reports to the corporate controller at Westinghouse headquarters in downtown Pittsburgh.

In his new capacity, New now will be a client of the computer center, rather than its boss. Already he has several projects in mind for further conversion to data processing.

New feels that the past decade saw tremendous advances in the computer art. He thinks that the 60's will witness major advances also, particularly in the area of communications. This, New bases on the fact that communications is one of the biggest needs of the industry.

Further predictions ventured into by New, is that there will be a trend toward large scale computer centers, with satellite areas feeding into and out of centers on high speed communication links. For example, by 1970, New sees the possibility of grocery stores ordering their supplies by means of communication links into some central warehouse computer. ■

"Oh, no! . . . We gave up that form of communication long ago."



Typical configuration of the Librascope system includes four digital computers, one memory unit, six magnetic tape units, four random-access disc storage units, two input-output buffer processors, two real-time clocks, one automatic test console and one central supervisory console.

Librascope System Handles Heavy Data Flow

Product Preview

DEVELOPMENT of one of the world's fastest and most powerful computer systems, the L-3060 has been announced by General Precision, Inc.'s Librascope Div.

The typical configuration of equipment (shown above) of this digital, multiple-computer L-3060 system will perform 2,480,000 operations per second and retrieve information from memory in less than a millionth of a second.

The transistorized system has high-speed core memory access to 144,000 words, random access to 3,250,000 words stored in magnetic disc files and magnetic tape storage files of 9,000,000 words. The random-access information can be retrieved in 17 thousandths of a second and all files are expandable.

Librascope president W. E. Bratton said that the L-3060 is specifically designed for the growing space-age problem of converting large volumes of raw data into usable information.

Features tailored to meet heavy data processing needs include: Simultaneous problem solution provided by the multiple-computer concept; a priority function where the system will stop processing one problem, handle a more important problem and then continue processing the original one from where it was stopped; provision for both data processing and scientific computing; visual display of information; optimum processing of random inquiries; and automatic error check.

A capability of expanding the L-3060 system by easily adding computers and other units is provided by modular trunk line organization allowing additional units to be plugged into the network.

Basic speed characteristics of the L-3060 are augmented by high reliability, Bratton said. All elements of the system are designed to enhance the L-3060's speed, including a high-speed file search organization.

The system evolved from Librascope's Central Data Processor, built for the Federal Aviation Agency. The distributed design concept of the L-3060 links a series of large, fast computers into an ultra-fast inter-communications network. Computers communicate through a shared memory device in less than a millionth of a second.

Deliveries of the L-3060 are on a 10-month basis. Prices for any system will vary depending on the configuration. Circle No. 101

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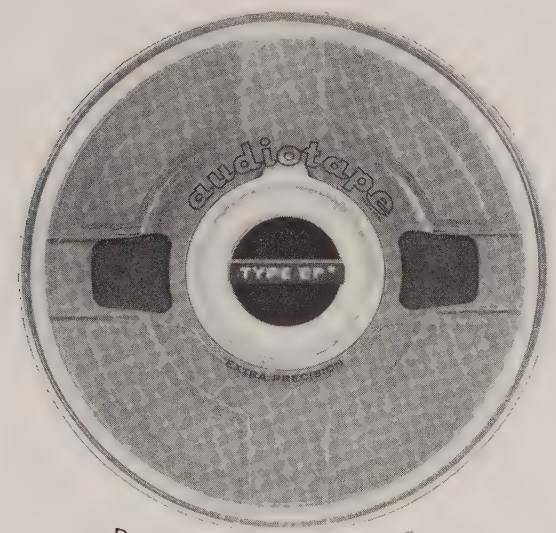

Products are judged by the customers they keep. And for years EP Audiotape, the extra precision computer tape, has been ordered (and reordered) by the most prominent firms in the country. ■ The reasons are evident. Stringent manufacturing procedures insure tape of the finest quality—a fact confirmed by the continuing tests of customers' own engineers. ■ The precision built into EP Audiotape is complete assurance that it will perform and perform consistently on computers, in telemetry, seismography and automation. ■ Why not investigate EP Audiotape for your computer? Every reel is 100% certified according to all the computer manufacturers' own specifications. ■ For more specific product information, get in touch with Computer Department, AUDIO DEVICES, INC., 444 Madison Avenue, New York 22, N. Y.

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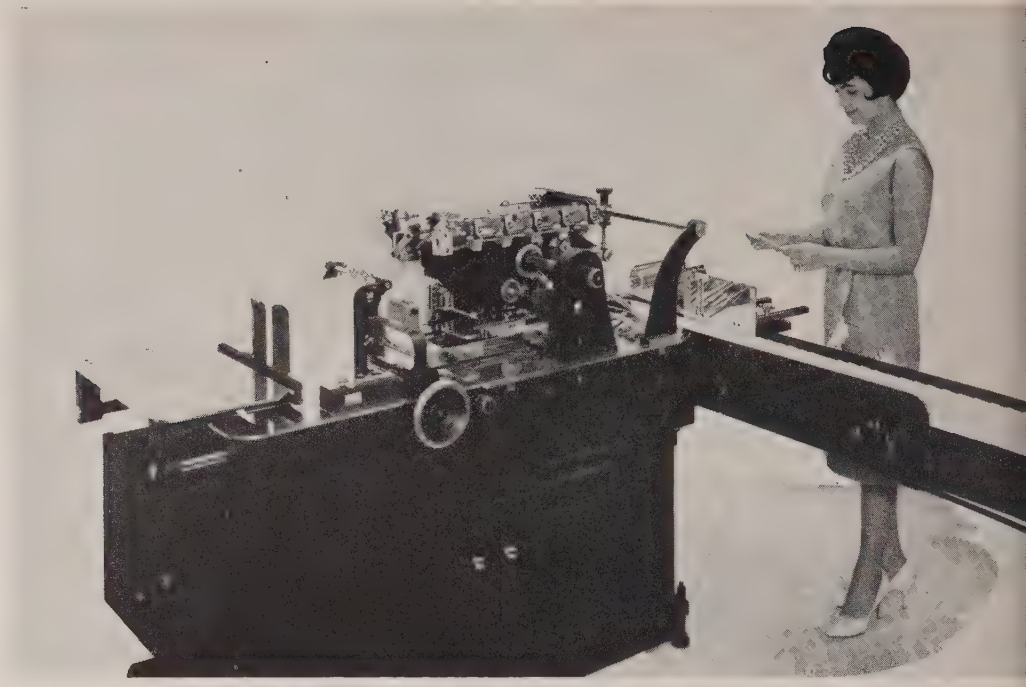
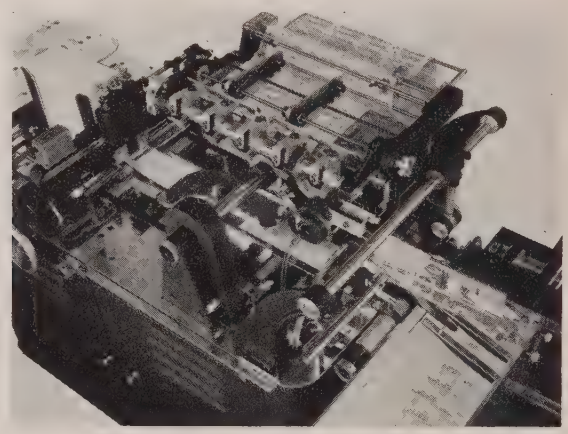
For More Information Circle Reader Service Card No. 168

Product Preview



Any standard Cheshire labeling machine can be converted with a head (shown below) to apply labels to printed pieces from multiple-width forms printed out on a computer.

Special Head Applies Multiple-Width Labels



A NEW labeling head now applies labels to printed pieces from multiple-width label forms prepared on high speed, print-out equipment linked to a computer.

The head has been announced as an addition to any of the standard labeling machines now manufactured by Cheshire, Inc. The addition is specifically designed to handle labels printed in sequence from left to right on forms three, four and five labels wide. These forms make it possible to print labels at the speed of computer output from magnetic tapes.

The direct "print out" method of labeling from the computer onto multiple-width label forms is said to reduce printing time by as much as 18 percent over conventional one-wide tape strip preparation.

The wide forms are fed by tractors to a guillotine cutter on the labeling machine, which shears off the strip of three, four or five labels. This strip of labels is then picked up on a wheel and cut into individual labels as the wheel revolves.

The individual labels are picked up by a vacuum wheel, carried past a glue-applying roller, and applied to the printed material. Up to 18,000 labels can be applied per hour. Circle No. 102

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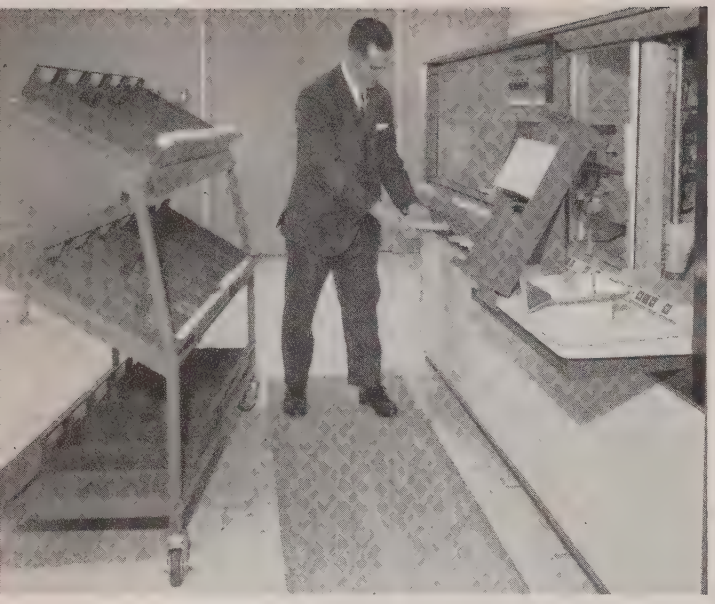
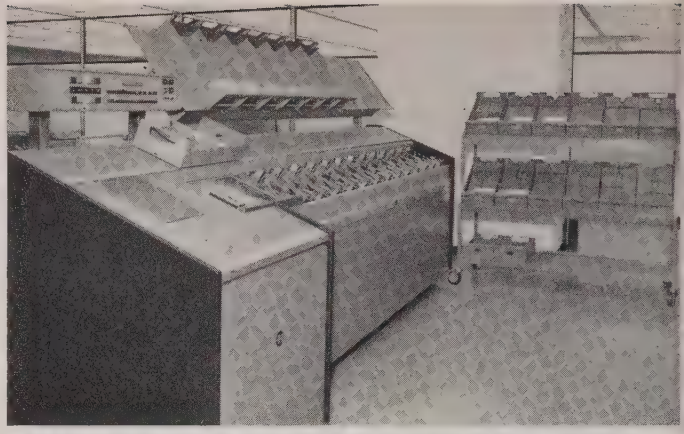
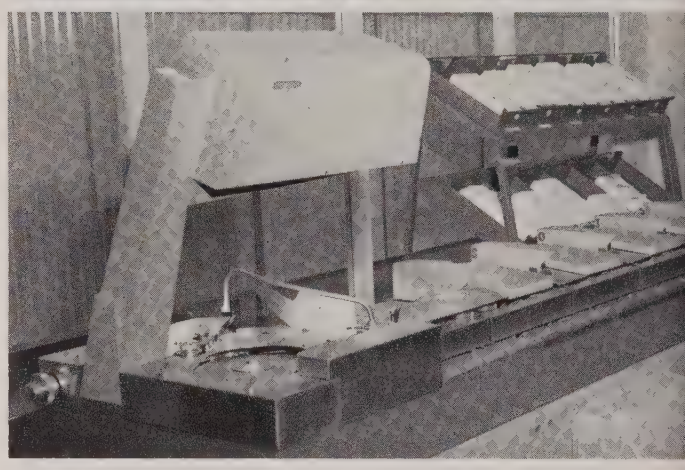


Above, Wright line's Docutray Check Handling Equipment is used on an IBM Check Sorter.





Upper picture, Docutray units on Burroughs sorting equipment. Lower picture is with Pitney Bowes-National.

Check Handling Units Accommodate Individual Sorters

Product Preview

DOCUTRAY accessories specifically designed for use with International Business Machines, Burroughs and Pitney Bowes-National check sorting equipment has been announced by Wright Line Div. of Barry Wright Corp.

Accessories include the #1431-10 Docutray Truck; a #1432-10 Docutray Ramp, fastened to the reading board of the sorter near the check feed; a #1433-10 Docutray Rack; and #1430-12 Docutrays. Feature of the Docutrays is the innovation of a labeling method which is located on the front top edge of the tray. The operator adjusts a button on the front of the Docutray, and in the window above, a character indicates the particular sorting arrangement of the checks in the Docutray.

Likely complement of Docutray accessories, for example, is one Docutray Truck, one Docutray Ramp and at least 13 Docutrays. The truck stands behind the operator as he faces the check sorter (shown in picture at left above). The casters are locked with the foot pedal. The Docutray Ramp is fastened to the sorter reading board so as not to obscure lights, which must be seen by the operator.

There are 13 pockets on the IBM sorter A, B, 0 - 9 and reject.

Each Docutray is numbered accordingly at the beginning of the sort. Checks falling into the reject pocket may be placed in a Docutray on the shelf, on the IBM work shelf, or in the A or B Docutray.

All compressors are set at the rear of the Docutray. If one Docutray becomes full during the sort, it is placed on the shelf and replaced with an empty Docutray. Labels are changed to match identity.

When the entire sort is completed, the operator unlocks the casters with his foot and the checks are wheeled to storage or to file clerks for sorting by account number. Docutrays may be stacked on the desk of one clerk for filing.

For use with Burroughs equipment, Docutray accessories recommended are the Docutray Truck, at least 13 Docutrays and one Docutray Rack, instead of the Ramp. The Burroughs machine has a sorter rack with a pocket for each sorter pocket not big enough for large sorts. The Wright Line rack is clamped over the Burroughs rack and the Docutrays are placed in it, as shown in the top right hand photograph.

The Pitney Bowes-National sorter also uses one Docutray Truck and at least 13 Docutrays. No ramp or rack is required. Circle No. 103

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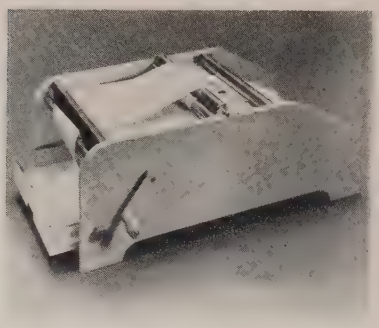
Business Automation Showcase

Automatic Refiler

"Electrofile" has been announced by Acme Visible Records as an advanced concept in the filing and finding of data. The unit is said to end refiling. After use, cards can be put back at random anywhere in the file. At the touch of a finger on the Electrofile keyboard, the operator can produce any single card or group of cards immediately. Using the same keyboard, new cards are coded by any desired classification—name, number, class of information or fact. Circle No. 105

Continuous Forms Burster

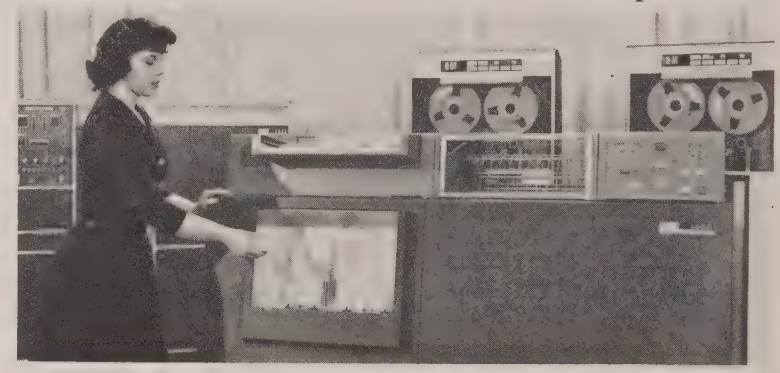


A new, low cost, continuous forms burster has been announced by Tech Panel Co. An entirely new design concept eliminates the use of knives, slitters or hammers. Available now as a manually operated model, it will burst all forms 3 to 11-in. long and in any width up to 15-in. A single knob automatically adjusts the machine for both proper form length and feed tray setting. The unit is compact and portable. Dimensions are 31¾ x 18-in. and it weighs about 45 pounds. It will sell for $225. Circle No. 108

Numeric Interrogator

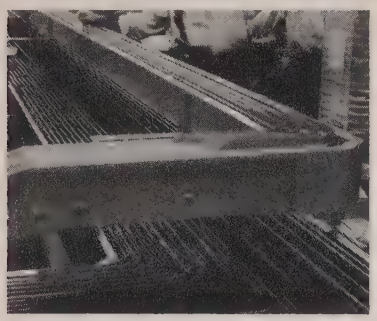
A numeric interrogator which will make point-of-use automatic data processing possible has been introduced by Information Products Corp. Model 2501 looks like a compact adding machine with a built-in television screen and can send and receive information to and from remote data processing equipment in seconds. It can be used in banks, reservation handling, order processing, credit checking, insurance investigation, inventory and production control. In addition to requesting information, the 2501 interrogator can add new information to the data file. Circle No. 110

Printer for Card Documents/Continuous Paper Forms



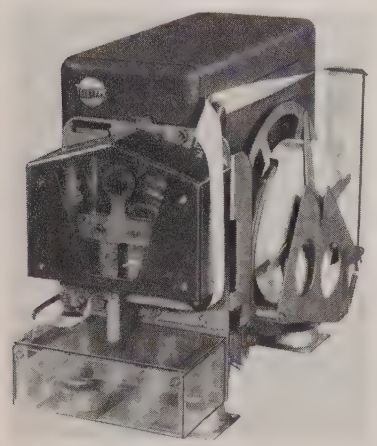
A high speed printer, said to be the first to combine the printing of either individual cards or continuous paper forms as direct output from a solid-state computer, has been introduced by International Business Machines Corp. The IBM 1404 printer is designed for use with the 1401 data processing system and is available as optional equipment instead of the IBM 1403 continuous forms printer. The 1404 incorporates all the basic continuous forms features of the 1403, including IBM's exclusive chain-printing technique to assure accurate impressions and alignment. In addition, it is equipped with a new card document station. To switch from cards to forms printing, or vice versa, the 1404 operator positions its movable chain-printing mechanism horizontally to the card station on the right. Information to be printed in either mode is fed to the 1404 via the core storage of the 1401 computer from punched cards or magnetic tape. The new printer extends the power and speed of the 1401 system to many areas throughout business, industry and government using printed card documents, such as checks, statements, invoices. Circle No. 109

Conveyor System

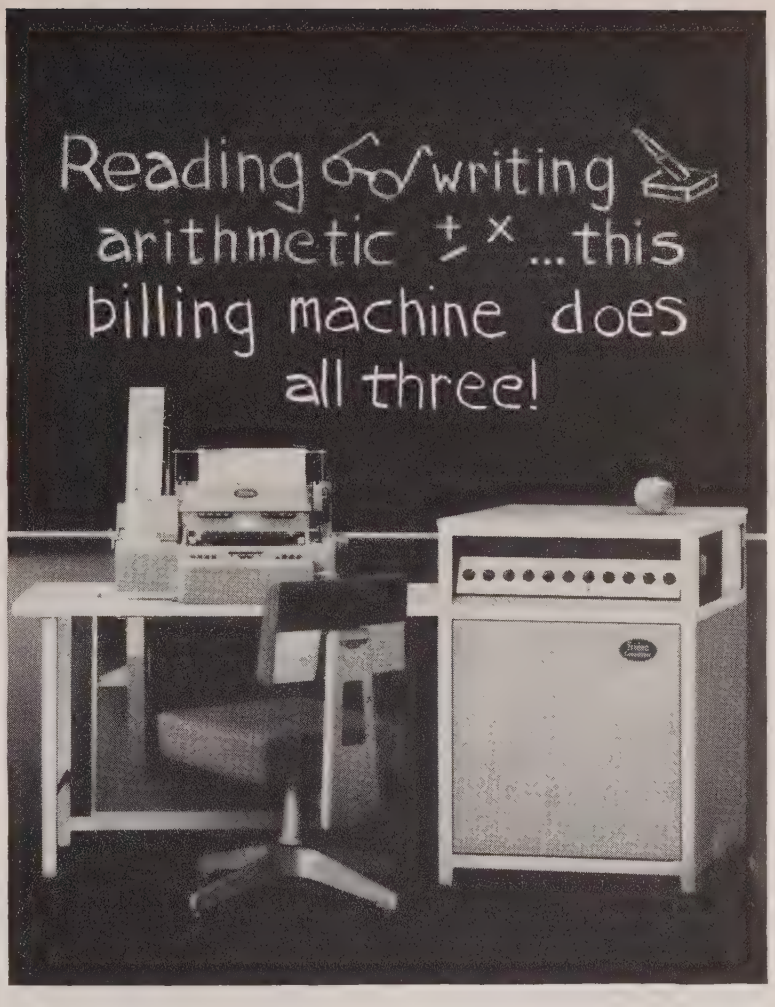


A heavy flow materials handling conveyor system has been introduced by Novak Co. All sections are made of anodized aluminum to assure trouble free operation. Novak Multilane Conveyors feature single lane construction so that any lane may be removed for relocating and counterdirectional split positions. The conveyors are adjustable to any floor conditions, or heights; and they are capable of making 90 degree turns. The belt return section is completely enclosed to keep moving belts clean. Circle No. 107

Tape Units



Two, high speed 100-character-per-second tape units have been introduced by the Teletype Corp. The equipment is designed for use in message and data communications, including various computer applications and other data handling communications uses. The "BRPE" tape punch and the "CX" tape reader operate as a complementary pair for use in high speed, tape-to-tape communications systems. They also can be used as input, output devices for computers. Circle No. 113



The Friden Model CTS Computyper® is a remarkable machine; it *reads* constant data from punched tape or cards, *writes* the data down on the invoice, automatically does all the *arithmetic* required to figure a bill. The operator does little more than fill in the date and the item quantities.

For the average business, one girl and one machine can be the entire billing department.

Important plus: The Computyper automatically produces a by-product punched paper tape summary of each invoice. This tape can be automatically converted into tab cards or fed directly into computers. (If you don't use this type of data processing, simply run the by-product tape back through the Computyper and it will give you a typewritten billing summary.)

For complete information, contact your Friden Systems representative, or write: Friden, Inc., San Leandro, California.

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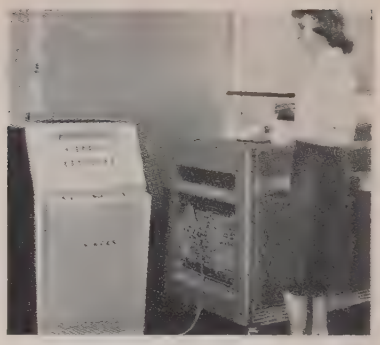
Table Model Facsimile Equipment

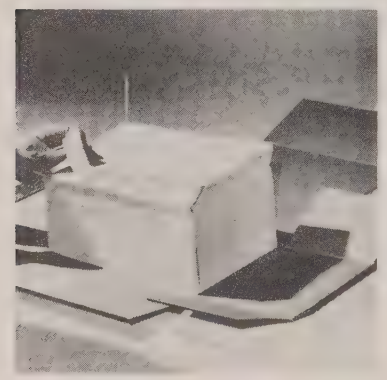
A new line of compact, moderately priced facsimile communications equipment has been introduced by American Facsimile Corp. Amfax, designed for small businesses or industrial firms, makes practical instantaneous transmission and receipt anywhere in the country. Material sent could include financial and credit information, sales reports, letters, orders, production or inventory reports, working plans, charts and photos. Transmitting and receiving units are table model and produce clear, sharp copies. Transmission by drum feed of any kind of black and white copy from paper up to 8½ x 13-in. is possible. Color will reproduce in black and white with 13 degrees of gray shading. Installations could be between central and branch offices; advertising agencies and out of town offices; department stores and suburban outlets; between executive, sales, financial, production or shipping sections; or plant and regional offices. Units will transmit or receive written, printed or photographic copy over telephone lines, direct wire or by microwave at the rate of 3¼ minutes per letter-size document. Two points are emphasized: the ability to transmit color to be received in black and white, and the fact that no special paper is required. Delivery is available 60 days after order. Circle No. 106

Memory Attachment



Users of standard IBM punched card systems will be interested in the Singer Electronic Memory Attachment introduced by HRB-Singer, Inc. This development of a compatible electronic memory for use with IBM equipment, extends, complements and increases the effectiveness of the tabulating machines by extending a random access memory. Single drum systems add, subtract and multiply with a capacity of 2,000 ten digit numbers and utilize 2,000 addresses. Attachment is accomplished at any time by wiring between program control panels of the two machines. Circle No. 104

Storage Binder



A new, low-cost method for permanent storage of punched office forms is provided by two versions of the Perma Snap Binder, created by Office Equipment Mfg. Co. Eighteen stock models are offered with ⅛-in. flexible nylon posts for marginal-punched burst and unburst forms; 30 models are available with 3/16-in. aluminum posts for all other office forms. Forms are bound into rugged fibreboard storage cartons that later may be opened intact. Cartons assure protection against dust, dirt and moisture. Circle No. 111

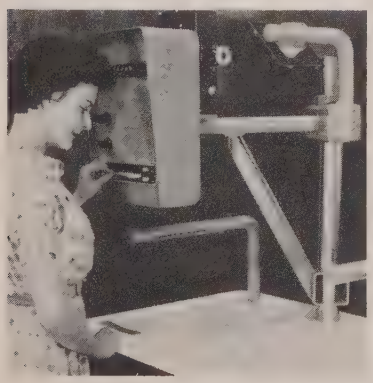
Transistorized Computer On Wheels

A mobile DE-60 M transistorized computer, designed for users with multiple applications, has been announced by Clary Corp. The four-wheeled unit is a direct entry DE-60, contained in a walnut cabinet, with input and output units recessed in top surface wells. The programming unit is located at the front and the arithmetic center is accessible from the rear. The unit is available with typewriter, punched tape or line printer output. Complete DE-60 M is 33-in. wide, 26-in. deep and desk high; it weighs 304 lbs. It is priced at approximately $21,000 and has a delivery schedule of 60 to 90 days. Circle No. 112

Closed Circuit TV

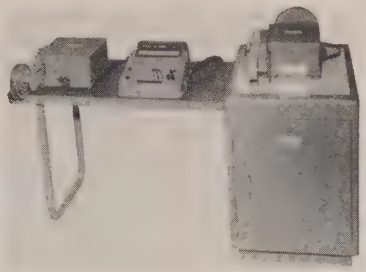
A new Model V-945 camera with 650-line picture resolution has been recently introduced by the Vicon Div. of American Microwave and Television Corp. The system is designed for application in banks, hospitals, medical clinics, security brokerage firms, public schools, universities and colegges, government agencies and industrial plants and offices. The camera transmits clear images of typewritten messages and smaller types. Circle No. 115

Recording Camera



A new, high resolution recording camera has been developed as part of FMA, Inc.'s FileSearch system for automatic information storage and retrieval. Designed and built by FMA the camera simultaneously puts a code field and document image onto frames of microfilm for ultimate search and retrieval by the FileSearch retrieval unit. The recording camera, filming table and stroboscopic lighting fixtures comprise the unit. Code field is put onto the film from an edge punched card input. Circle No. 114

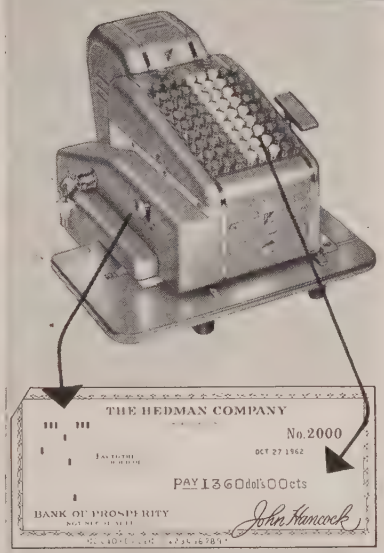
Tape Punch/Verifier



The Model D875 Universal Code Punch and Verifier System has been announced by Systematics, a division of General Instrument Corp.

The Model D875 is designed to provide a fast, accurate and economical means of manually punching and verifying from an original document into paper tape machine language. The system combines tape keypunching and verifying functions into one integrated system. Punching and verifying may be done on all systems—five to eight-channel tape — in any code structure. System consists of an alphanumeric keyboard, a paper tape punch, a tape reader and interconnecting control circuitry. Circle No. 116

Now— A CHECK PROTECTOR WITH A BUILT-IN KEY PUNCH



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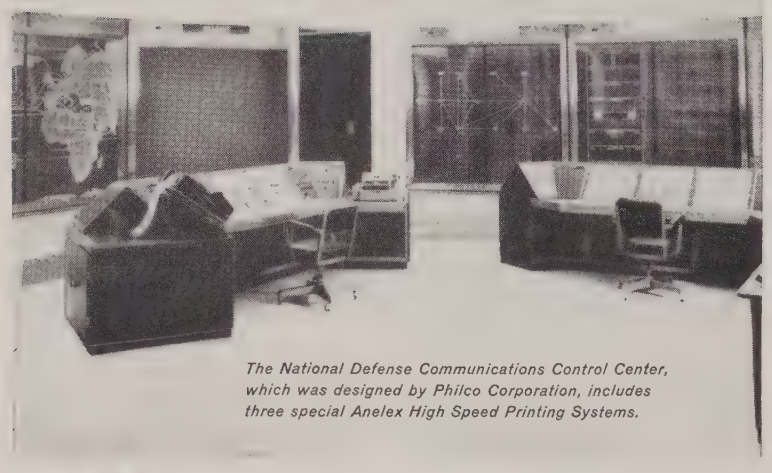

The National Defense Communications Control Center, which was designed by Philco Corporation, includes three special Anelex High Speed Printing Systems.

Further information available upon request

ANELEX CORPORATION

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Copies On Request

Philco 2400 — A brochure from Philco completely describes a new high-capacity EDP system combining the 2000 with the new 2400 peripheral equipment. Circle No. 130

Mass Memory Disc File — Bryant Computer Products Div. of Ex-Cell-O Corp. explains to manufacturers the advantages of their new random access, mass memory, magnetic disc file. Circle No. 131

Product Digest No. 160—The complete product line of Midwestern Instruments from tape equipment to oscillographs and telemetry devices is displayed in this catalog. Circle No. 132

Data Acquisition System—The Datex Corp. DL-210 system of acquiring accounting and production data, its components and their functions are explained in a folder. Circle No. 133

Digital Measuring System—An illustrated, 12-page data file tells about Computer Measurements Co.'s digital measuring system, built around a universal counter-timer. Circle No. 134

Film and Tape Splicers—A brochure describes Prestoseal Mfg. Corp. and its products, including film and tape splicers, aperture-mounting machines. Circle No. 135

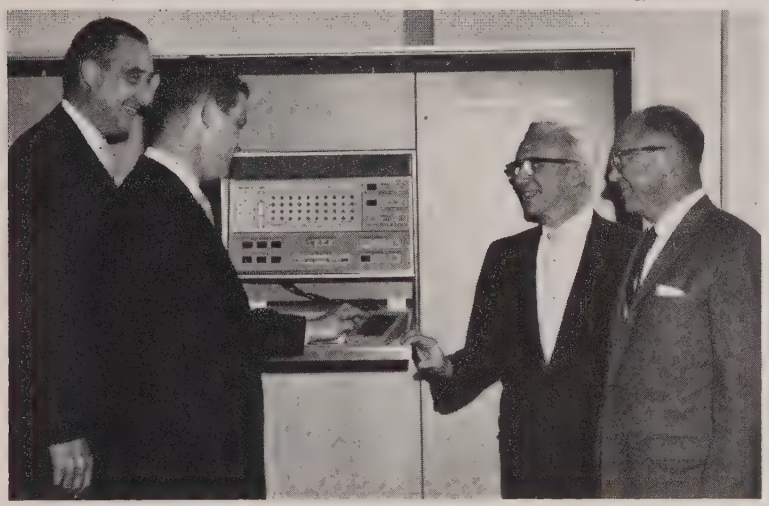
Scientific Management of Inventory — A pamphlet covering policies and inventory rules designed to minimize cost is available from Planning Research Corp. Circle No. 136

Remote Microfilm Readout — A GPL Div. of General Precision, Inc. device tied to closed-circuit television permits access to microfilmed data in remote locations. Circle No. 137

Interrogators — A booklet entitled "New Horizons in Man-Machine Communications" is available from Information Products Corp., describing use of their Interrogator units in point-of-use automatic data processing. Circle No. 138

NEWS

Variety Chain Is First to Install Computer



The first variety chain to install an electronic computer, Neisner Brothers, Inc., Rochester, N. Y., will handle 12.5 million annual billings, 4.9 million inventory items, 20,000 W-2 reports, 1.3 million invoices and payroll records for 8,000 full-time employes on a Univac Solid-State 90. Above, M. B. Neisner, president (right), discusses the computer's capabilities with his staff.

Machine Accountants Elect Pia to Presidency

Alfonso G. Pia, director of data processing for the Church of Jesus Christ of Latter-Day Saints, Salt Lake City, has been elected president of the National Machine Accountants Assn. for the coming year. Elmer F. Judge, Cessna Aircraft Co., was elected executive vice president.

The elections took place at the NMAA's annual business meeting, held during the tenth anniversary conference in Toronto, Canada, June 27-30.

Elected vice presidents at large were John L. Brandt, TV Guide, Radnor, Pa.; Robert S. Gilmore, Ryan Electronics, Torrence, Calif.; Carroll D. Parry II, North American Aviation, Inc., Columbus, Ohio; Charles H. Prince, American Society of Tool & Manufacturing Engineers, Detroit; Eugene I. Sheehan, Warner Bros. Pictures, Inc., Burbank, Calif.; John K. Swearingen, General Electric Co., Louisville, and Daniel A. Will, Canadian National Railways, Montreal. Clyde DuVall, Peoples Gas Light & Coke Co., Chicago, was re-elected treasurer.

John J. Wilk, Union Carbide Plastics Co., New York, was elected vice president—1962 National Conference, which will be held in that city. Detroit and New Orleans previously were awarded the 1963 and 1964 meetings; Philadelphia was selected as the site for the 1965 conference.

NMAA Names Adams as Educational Director

James M. Adams, Jr., of Salem, Ore., has been appointed Director of Education for the National Machine Accountants Assn., according to an announcement by Calvin Elliott, NMAA executive director. Adams will direct the educational efforts of the 14,500-member organization from NMAA's International Headquarters in Mount Prospect, Illinois.

Prior to his appointment, Adams was a systems and methods analyst for the EDP Div. of Minneapolis Honeywell. Under private contract with the Oregon State Dept. of Vocational Education, he recently developed courses, class outlines, prerequisites and texts for an entire two-year college curriculum in EDP technology.

WESCON Meeting, Exhibit To Be Held August 22-25

San Francisco's Cow Palace will host the 1961 Western Electronic Show and Convention, August 22-25. Over 35,000 are expected.

Manufacturers have reserved 1,180 booths in which to display the latest in electronic products during the four-day show. Forty technical sessions will be conducted and field trips will be offered to Litton Industries, the University of California, Stanford University and Stanford Research Institute, Melabs, and Hewlett-Packard Co.

Computing Machinery Assn. to Meet in L. A.

The 16th National Conference of the Assn. for Computing Machinery will be held September 5-8 at the Statler-Hilton Hotel, Los Angeles. For the first time, the meeting also will feature a hardware show — the 1st International Data Processing Exhibit, including displays by 33 manufacturers.

Talks, roundtables and discussion sessions will be held, and over 90 papers will be read at the conference. Benjamin Handy, Jr., general chairman, says over 2,000 association members are expected to attend.

Field trips will include tours of the Bendix G-20 assembly line and the National Cash Register NCR 315 assembly line and testing facilities, Handy added.

Bryant Markets New Memory System

The delivery of a complete information storage system to Rabinow Engineering Co., Washington, D. C., marks the entry of Bryant Computer Products Div., Ex-Cell-O Corp., into the memory systems field. The Rabinow system will be installed in a postal drum directory system being produced for the U. S. Post Office Department.

According to Bryant, other memory systems have been developed, with capacities ranging from less than 100,000 bits to 720 million bits.

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Montreal: 407 McGill St., Montreal, Canada. Victor 2-3831
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Business Calendar

August 22-25—Western Electronic Show and Convention, sponsored by the Institute of Radio Engineers and the Western Electronic Manufacturers Assn. will be held at the Cow Palace in San Francisco. More information may be obtained by writing: WESCON Business Office, 1435 S. LaCienega Blvd., Los Angeles.

September 5-8—Sixteenth National Conference of the Assn. for Computing Machinery and First Data Processing Exhibit, Statler-Hilton Hotel, Los Angeles. Contact: Benjamin F. Hardy Jr., Gen. Chairman, Litton Systems, 550 Canoga Ave., Woodland Hills, Calif.

September 11-13—National Convention of the Assn. for Bank Audit, Control and Operation, Conrad Hilton Hotel, Chicago. Write: Jack Craddock, Dir. Public Relations, NABAC, 38 S. Dearborn St., Chicago 3.

September 11-15 — Instrument Society of America's 16th Annual Instrument-Automation Conference & Exhibit will be held in the Biltmore Hotel (c) and the Memorial Sports Arena (e), Los Angeles. Contact: Ralph Stotsenburgh, director, promotional services, 530 William Penn Pl., Pittsburgh 19, Pa.

September 28-29 — Fourth Annual National Conference and Technical Exhibit of the American Production and Inventory Control Society, Pick-Congress Hotel, Chicago. National Headquarters: 330 S. Wells St., Chicago 6.

October 8-11 — International Systems Meeting of the Systems and Procedures Assn. will be held in Cleveland, Ohio, at the Statler-Hilton and Pick-Carter Hotels. The 14th annual meeting's theme is "The Systems Field — A Management Transition." For more information: Lawrence E. Melick, Secretary, 1961 ISM, c/o Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.

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EDITORIAL

A Goldberg Device

Despite strong and documented evidence to the contrary, the administration continues to attack automation as if it were the root of all our domestic evils. The latest move—a grandiose plan to shift a million jobless workers across the nation—is one of sinister import. Details of the program were reported in a recent dispatch by Victor Riesel, who writes on "Inside Labor" for the New York Mirror.

Riesel discloses that Secretary of Labor Goldberg has devised a plan for retraining and relocating a million workers—allegedly thrown out of work by automation. To administer the plan, Goldberg will create a big new Bureau of Automation, Manpower and Training which will handle the permanent assignment of retraining the unemployed and constantly moving the re-skilled jobless thousands of miles from depressed to prosperous areas. In addition to being paid during their retraining program, the workers will be given lump sums for moving their homes and families to available jobs.

Using the peculiar logic which prevails along the Potomac, one might reason that Mr. Goldberg, with a stroke of genius, has solved the unemployment problem for all time. Everyone will either be part of an all-expense-paid safari in search of more attractive employment or busily engaged in the new bureau, keeping track of those on the safari. One small problem might arise when the Secretary finds it necessary to turn to automation in order to keep up with the tremendous load of paperwork involved.

The whole idea is not only idiotic, but dangerous, as is much of the administration's approach to the problems of automation. Phony and confusing figures, half-truths and union propaganda constantly are released as official facts. Automation is blamed for everything but the President's aching back. Even here it may be suspect, for the President's chief advisor on youth fitness, Bud Wilkinson, has charged that "automation is responsible for young Americans becoming increasingly soft."

We realize that technological progress brings about changes in our economy and reallocation of job opportunities. But government by bureaucracy solves none of these problems. A much more sensible approach is contained in a bill introduced in Congress by Rep. Thomas B. Curtis (R-Mo.), which proposes personal income tax deductions amounting to as high as $1,500 for individuals of any age who train for higher skilled jobs to avoid possible unemployment due to automation. The Curtis bill is appropriately described as "a private enterprise solution" to the problem of providing an ever-increasing level of skills for our more complex and challenging society. It merits the attention of the Secretary of Labor.

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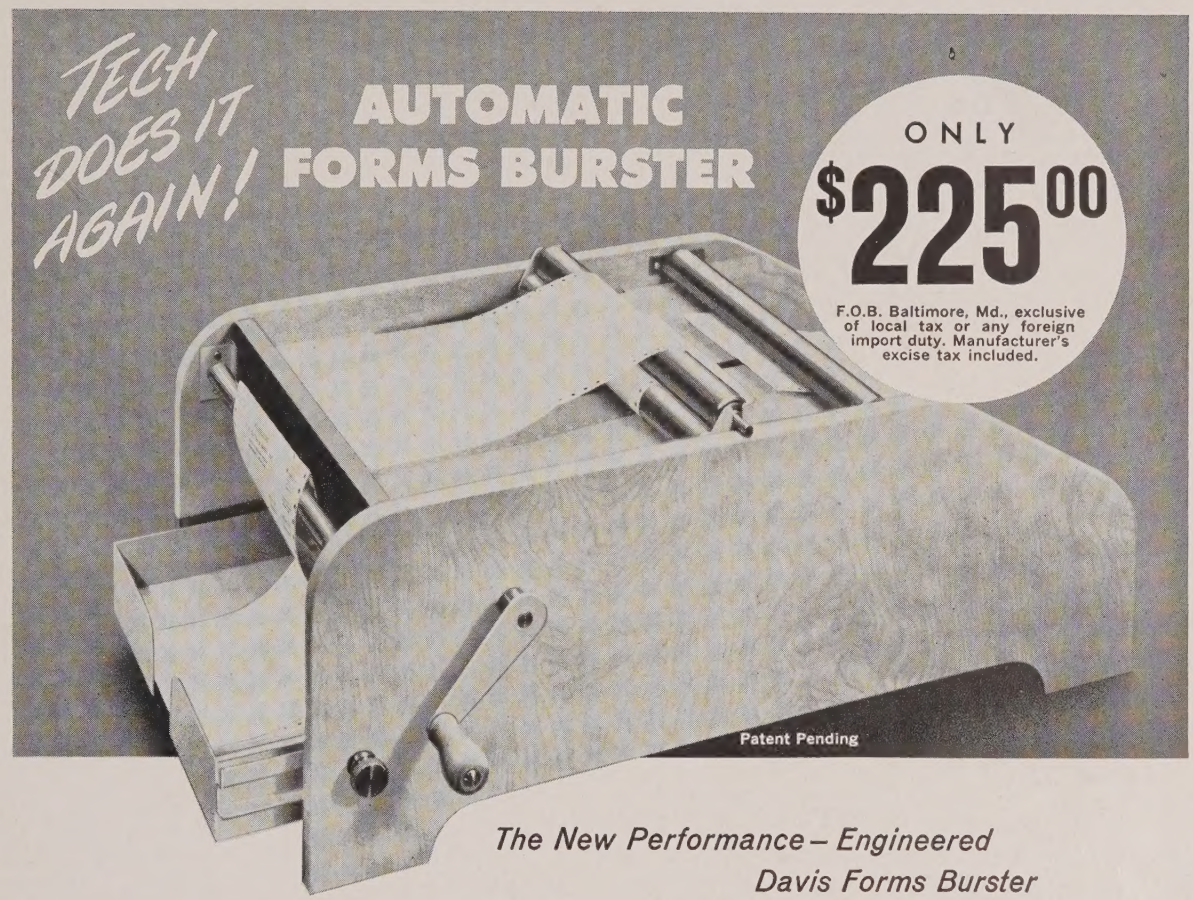
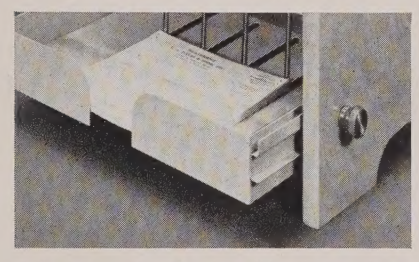


The New Performance–Engineered Davis Forms Burster

Take the bottleneck out of continuous forms bursting with TECH Panel's new Davis Automatic Burster! This low-cost, precision machine is your answer to decentralized bursting . . . so simple that even the office boy can run it. In seconds, a single knob sets this machine for *any* form length from 3″ to 11″. It takes a stack of forms 5¾″ high in any width up to 15″, bursts even the last form, and is completely fool-proof!

Using an entirely new design concept, the new Davis Automatic Burster has no knives, slitters or hammers. No rubber rollers to harden—nothing to get out of order or adjustment. With this new unit, it's impossible to crease a form beyond use, feed it through the machine crooked or jam the burster. Sealed-for-life ball bearings eliminate lubricating problems. In fact, the unit is so maintenance free, that *service contracts are not needed!* It's guaranteed for 12 full months against defects in workmanship and materials.

This completely portable machine will fit a space 31¾″ by 18″. Ready for shipment, it weighs only 45 pounds. Because it's a high-speed, manually operated unit, electric outlets are unnecessary. Set it anywhere and you're ready to run. Find out how quickly this time-and-labor-saving burster will pay for itself. Ask your TECH Panel Dealer to give you a free demonstration. *Write today for full information!*



Adjustment is simple with this unique burster. To set the machine, place forms in the feed tray and push tray until forms touch rear stop. Lock knob, thread forms through the automatically-set feed rollers and you're ready to go. When not in use, the tray is pushed in flush with the frame for compact, space-saving storage.

LEASE FOR ONLY $1.72 A WEEK

Under TECH Panel's TPC Leasing Plan you can put this new Davis Automatic Burster to work immediately for as little as $1.72 a week, based on a 3-year agreement, exclusive of local taxes. For details, see your TECH Panel Dealer or call TECH Panel Company, Inc., Binghamton, N. Y., RAymond 3-8231.

TECH PANEL
COMPANY INC.

37 Milford St., Binghamton, N. Y.
Telephone: Area Code 607—RA 3-8231

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